

THE INDEPENDENT GUIDE TO IBM PERSONAL COMPUTERS



Volume 3 Number 21
\$2.95

October 30, 1984

PC
NEWS:
IBM'S
SOFTWARE BLITZ

IBMs in Control: Project Planning With Your PC



**STM PC:
Flat and Sassy!**

**Peter Norton
On DOS 3.0**

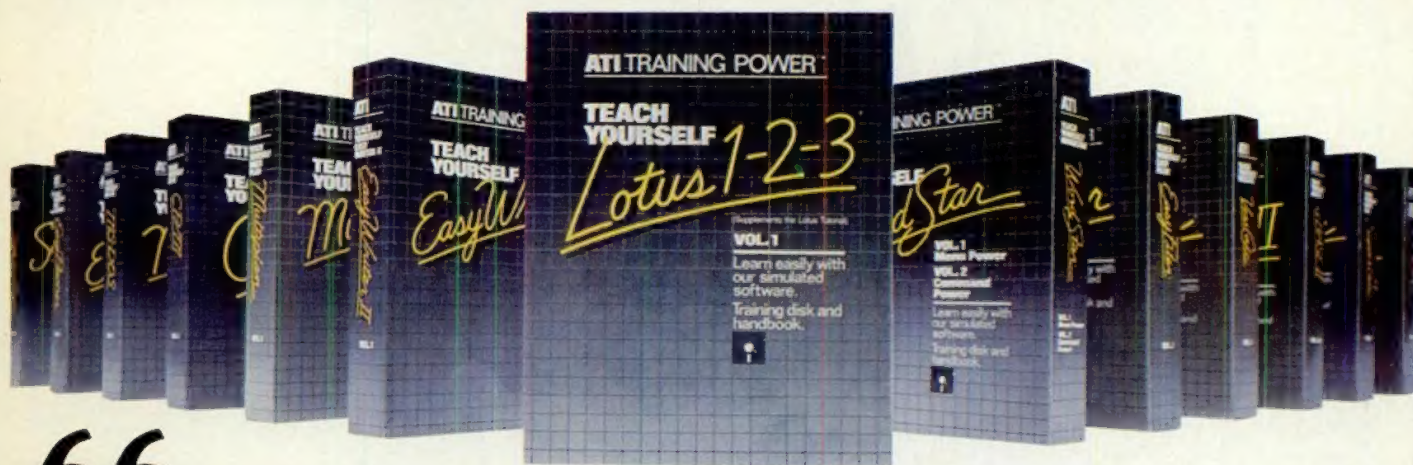
**Price Waterhouse Report:
Accounting with MAI**

**Display's the Thing:
Customize Your Color Board**



**The power
behind your PC is
right behind
this page.**

Who says ATI is the best way to learn software?



“

ATI could be the best learning tool yet.” (*Popular Computing*, Feb. 1984)

“ATI’s on-screen approach to training deserves a salute...” (*PC Magazine*, August 1983)

“(ATI) tutorials are a bargain.” (*Washington Times*, Sept. 13, 1983)

“The tutorials from ATI are competent, coherent, and efficient. They are well structured to accomplish their purposes.” (*List Magazine*, October 1983)

“The ATI method reduces the frustration level to zero.” (*Los Angeles Times*, October 30, 1983)

“ATI makes the best use of the tools available to teach you dBASE II: the computer you use it on.” (*Microcomputing*, July 1984)

“PC World readers have voted for the ATI Training Power series as their favorite in its category.” (*PC World*, July 1984)

“The ATI program does everything it’s supposed to do: teach someone WordStar.” (*Peter McWilliams*, May 1984)

“The ATI program is an ideal introduction to Lotus 1-2-3 that is designed to supplement the Lotus tutorial.” (*Interface Age*, March 1984)

“ATI impressed me with its \$12.95 sampler...” (*InfoWorld*, July 1984)

”

Please rush me the following programs:



ATI Skill-Based Learning Systems™

\$75 Training Power™ Programs

- ☐ MacCoach
- ☐ Lotus 1-2-3
- ☐ SuperCalc™
- ☐ dBASE II
- ☐ Microsoft Word™
- ☐ WordStar
- ☐ Multi Mate™
- ☐ Perfect Writer™
- ☐ Spellbinder™
- ☐ Multiplan
- ☐ Perfect Calc™
- ☐ Microplan
- ☐ TK! Solver™
- ☐ PeachCalc™

- ☐ BPI Gen. Acct.*
- ☐ Peachtree General Ledger*
- ☐ Peachtree Accounts Receivable*
- ☐ Peachtree Accounts Payable*
- ☐ Peachtree Inventory Control*
- ☐ Peachtree Sales Invoicing*

Please enclose the appropriate amount plus \$2.50 shipping. (CA add 6.5%)

Name _____ Phone (____) _____

Street _____

City _____ State _____ Zip _____

My computer brand is: _____

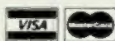
\$39.95 Skill Builder™ Programs

- ☐ How to Use Your IBM PC
- ☐ How to Use Your IBM PCjr.
- ☐ How to Use Your COMPAQ
- ☐ How to Use Your TI Professional
- ☐ Teach Yourself PC DOS
- ☐ Teach Yourself MS DOS
- ☐ Teach Yourself CP/M
- ☐ Teach Yourself BASIC
- ☐ Teach Yourself APPLESOFT BASIC

- ☐ Teach Yourself VisiCalc
- ☐ Teach Yourself Volkswriter™
- ☐ Teach Yourself the Home Accountant™
- ☐ Introduction to Word Processing*
- ☐ Introduction to Business Software*
- ☐ Introduction to Accounting*
- ☐ Introduction to Databases*

*PC (MS) DOS formats only.

For rush order call:
(213) 823-1129
(800) 421-4827



My computer uses:

- ☐ PC DOS
- ☐ MS DOS
- ☐ APPLE II CP/M
- ☐ APPLE IIe 80 col.
- ☐ CP/M

Dealers:
call for sales kit
(213) 823-1129
(800) 421-4827

ATI Money Back Guarantee

If you're not completely satisfied with how fast you learn with ATI Interactive Training Power Programs, simply return within 3 days for full purchase refund.

Mail order form to:
Software Training Company
A Division of ATI
12638 Beatrice Street
Los Angeles, CA 90066

The following names are trademarks of the following companies: ATI Training Power and Skill Builder of American Training International; CP/M of Digital Research; PC-DOS of IBM; WordStar of Micropro; MS-DOS, Multiplan, Microsoft Word, and BASIC of Microsoft; dBASE II of Ashton-Tate; SuperCalc of Sorcim; VisiCalc of VisiCorp; Microplan of Chang Laboratories; Peach Calc, of Peachtree Software; Spellbinder, of Lexisoft; Perfect Writer, and Perfect Calc, of Perfect Software; Lotus, of Lotus; Compaq, of Compaq; IBM PC and IBM PC jr. of IBM; TI Professional, of Texas Instruments; Multimate, of Multimate International; TK! Solver, of Software Arts; Volkswriter of Lifetree, Inc.; Home Accountant of Arrays, Inc.

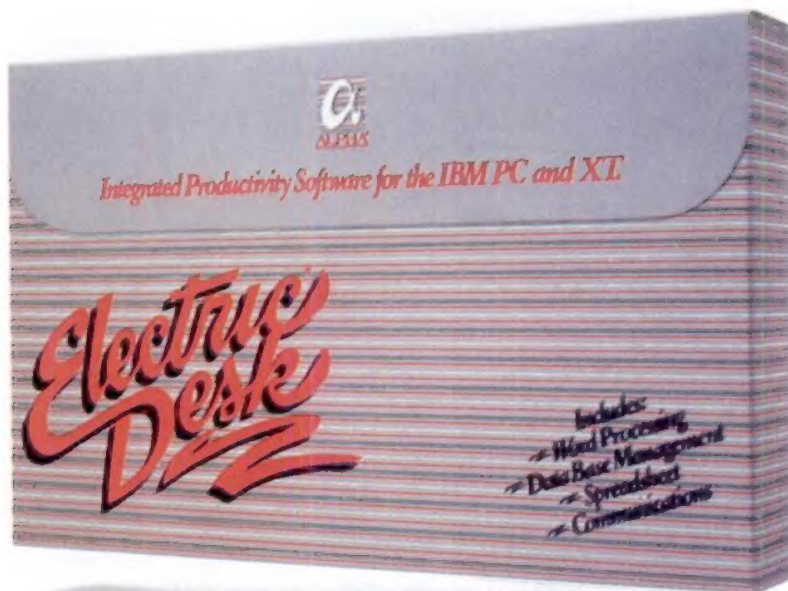
CIRCLE 123 ON READER SERVICE CARD

Copyrighted ma

SIMPLE.



SIMPLY POWERFUL.



Basically, we agree with PFS®. If you're looking for some power from software that's essentially simple, there are several PFS packages you might look at.

But if what you really want is genuinely powerful software, that's also simple to use, you'll do better with one new package from Alpha®

It's called Electric Desk™ and it's word processing, spreadsheet, communications and file management with report writing, all in a single integrated program. What's best, you can run them all at the same time, because it's all on a single disk.

So you not only get to do more work with one Electric Desk than with several PFS's. You also get to do things PFS simply can't. Like jump instantly from a letter to a budget to a customer list, over to a stock

report and back, with just a couple keystrokes. PFS makes you save files, change disks and waste a lot of time if you want to do anything like that.

Plus Electric Desk lets you do something else that's never been done before—save money. Because for \$345.00* you get a complete IBM PC/XT version of Electric Desk with all capabilities included. That's far more computing power than PFS delivers in a handful of packages for about \$600.00*.

So before you decide on software for your business, compare. We think you'll agree. When it comes to serious software, it's not how simple you make it. It's how you make it simple.

Electric Desk. It's the new force in software simplicity.

Also available for the IBM PCjr. for \$295.00.



1-800-451-1018 (in Massachusetts 1-800-462-2016)

*Based on manufacturers' suggested retail prices. Electric Desk is a trademark licensed to Alpha Software Corp. by Electric Software, Inc. Alpha Software Corp. is a registered trademark. PFS is a registered trademark of Software Publishing Corporation. IBM is a registered trademark of the International Business Machines Corp. © 1984 Alpha Software Corporation, 30 B St., Burlington, MA 01803. 617-229-2924

NO REFLECTIONS ON YOU!

with the
SDC ANTIGLARE SCREEN

Look at the face of your CRT. Its smooth surface reflects light like a mirror. Room lights, windows, the keyboard, even your hands, clothing and jewelry may be visible in it. Prolonged exposure to these distracting reflections causes eyestrain and unnecessary fatigue.

The **ANTIGLARE SCREEN** from Screen Data Corporation has been judged by an independent insurance company study to be the best solution tested to eliminate glare. Factors considered were user productivity, reduction of fatigue, ease of cleaning, durability, adaptability and cost.



The **ANTIGLARE SCREEN** is not glass or plexiglass but a finely woven mesh of tough synthetic material. The mesh passes text and graphics information from the CRT through to the eyes while stopping light from other sources from reflecting back to you. At the same time, the appearance of the display is enhanced because characters appear against a dark rather than a light background.

The **ANTIGLARE SCREEN** can be attached in moments. Velcro buttons permit easy removal. No tools or disassembly of your display is required. Over 200 sizes are available to fit most displays.

The **ANTIGLARE SCREEN** is only 39.95 postpaid. Try it for 30 days. You must be completely satisfied or your money will be refunded. Most popular sizes are in stock for next day shipment. Be sure to specify whether you have a monochrome or color display.

NEW **Power screen™** WITH SDC ANTIGLARE

The static field in front of the tube causes dust, smoke and pollen particles to move about more freely and increase eyestrain, irritability and fatigue. The new conductive **POWER SCREEN** completely discharges this static field. A metal strap connects it to chassis ground.

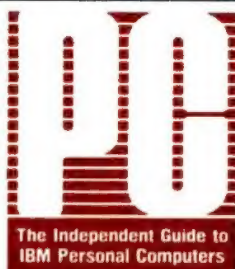
The **POWER SCREEN** is just 49.95 with the same 30 day satisfaction guarantee.

ORDER LINE
MC VISA COD
800-531-5273
(In Texas)
512-250-8757

Dealer Inquiries Invited



SCREEN DATA CORPORATION
DEPT. CSC
240 CEDAR KNOLL ROAD
CEDAR KNOLLS, NJ 07927



PUBLISHER	Jeff Weiner
EDITOR	Bill Machrone
EXECUTIVE EDITORS	Mike Edelhart, Connie Winkler
MANAGER, COPY EDIT	Anne Freed
MANAGING EDITOR	Barry Owen
SPECIAL PROJECTS EDITOR	Paul Somerson
TECHNICAL EDITOR	Craig L. Stark
ASSISTANT MANAGING EDITOR (INTERIM)	Posy Gering
ASSOCIATE EDITORS	Jennifer de Jong, Barbara Krasnoff, Stephanie Stallings
TECHNICAL ASSISTANT	Michael O'Conne
PRODUCTION EDITOR	Paul Ross
ASSISTANT EDITORS	Jean Atelsek, Victoria Danoff, Virginia Dudek, Nina Kirschner, Lisa Kleinman, James Langdell, Donald La Scala, Janet Lewis, David Obregon, Fredric Paul
EDITORIAL ASSISTANTS	David Baker, Cheryl Goldberg, Jane Mintzer, Roz Tobias
OFFICE MANAGER	Iris Knittel
PROOFREADERS	Gerald Carney, Michael Espindle
CONTRIBUTING EDITORS	Richard Aarons, Frank J. Derfler, Jr., Will Fastie, Stephen Manes, Peter Norton, Martin Porter, Winn L. Rosch, Corey Sandler, Jared Taylor, Robin Webster
EXECUTIVE ART DIRECTOR	Mitch Shostak
ART DIRECTORS	Mary Zisk, Gerard Kunkel
ART EDITOR	Mariano Nicieza
DESIGNER	Marjorie Crane
ASSISTANT ART DIRECTORS	Rosalyn Migdal, Louise White
MECHANICAL ARTISTS	Monique Cubicciotti, Ilisa Goodheart, Sara Whitford
PRODUCTION ARTIST	Susan Ahlman
SUBSCRIPTION DIRECTOR	Chet Klimusko
DIRECT MAIL MANAGER	Eric A. Bernhard
RENEWAL AND BILLING MANAGER	Shane Boel
MEDIA MANAGER	Ann Pichette
SPECIAL SUBSCRIPTION SALES	Daniel Rosensweig
ADVERTISING DIRECTOR	Eugene Duncan
DISTRICT MANAGERS	
NORTHERN CALIFORNIA and NORTHWEST	David Riegler (415) 598-2290
SOUTHERN CALIFORNIA	Barbara Farkas (213) 387-2100
NEW ENGLAND and NEW YORK	Ellen Atkinson (212) 503-5307
MIDWEST	John Hemsath (312) 346-2600
MIDATLANTIC and SOUTHEAST	Bob Ostrow (212) 503-5308
ADVERTISING SALES MANAGER/TELEMARKETING	Pauline Scherer
ACCOUNT REPRESENTATIVES	Jane Anderson, Lisa Kampmann, Kathy Krochta, Tom Leibacher, Patty Schwartz, Pam Sigal
ADVERTISING COORDINATORS	Helen Forgenie, Scott E. Pearl
ASSISTANT to the PUBLISHER	Suzanne N. Silver
ADVERTISING OFFICE	Ziff-Davis Publishing Company, One Park Avenue, New York, NY 10016 (212) 503-5100
FOUNDER	Anthony Gold

COMPUTER PUBLICATIONS DIVISION

PRESIDENT	Larry Sporn
VICE PRESIDENT MARKETING	J. Scott Briggs
VICE PRESIDENT CIRCULATION	Carole Mandel
VICE PRESIDENT GENERAL MANAGER	Eileen G. Markowitz
VICE PRESIDENT LICENSING AND SPECIAL PROJECTS	Jerry Schneider
VICE PRESIDENT CREATIVE SERVICES	Herbert Stern
CREATIVE DIRECTOR	Peter J. Blank
EDITORIAL DIRECTOR	Jonathan D. Lazarus
MARKETING MANAGER	Ronni Sonnenberg

ZIFF-DAVIS PUBLISHING

President Richard P. Friese; President, Consumer Magazine Division Albert S. Traina; Executive Vice President, Marketing and Circulation Paul H. Chook; Senior Vice President Phillip T. Heffernan; Senior Vice President Sidney Holtz; Senior Vice President Edward D. Muhlfeld; Senior Vice President Philip Sine; Vice President Baird Davis; Vice President George Morrissey; Vice President Rory Parisi; Vice President William L. Phillips; Treasurer Selwyn Taubman; Secretary Bertram A. Abrams

PC: The Independent Guide to IBM Personal Computers ISSN (#0745-2500) is published bi-weekly for \$34.97 for one year (26 issues), \$61.97 for two years, and \$81.97 for three years. Additional postage \$44.00 for Canada and all other foreign countries. PC Communications Corp., a subsidiary of Ziff-Davis Publishing Co., One Park Ave., New York, NY 10016. Second-Class postage paid at New York, NY 10016 and at additional mailing offices. POSTMASTER: Address changes to PC: The Independent Guide to IBM Personal Computers, P.O. Box 2445, Boulder, CO 80322. Editorial and Business Office: One Park Ave., New York, NY 10016. Editorial (212) 503-5255, Advertising (212) 503-5100. For subscription inquiries and service, write to PC Magazine, P.O. Box 2445, Boulder, CO 80322. PC is an independent journal, not affiliated in any way with International Business Machines Corporation. IBM is a registered trademark of International Business Machines Corp. Entire contents Copyright © 1984 PC Communications Corp. All rights reserved; reproduction in whole or in part without permission is prohibited. The following are trademarks of PC Communications Corp.: PC, PC: The Independent Guide to IBM Personal Computers, PC Mart, PC-Lab, PC-Communications, Project PC, PC Tutor, PC: BlueBook, User-to-User, PC News. Permissions: Material in this publication may not be reproduced in any form without permission. Requests for permission should be directed to Jean Lamendorf, Ziff-Davis Publishing Company, One Park Ave., New York, NY 10016. Editorial Communications may be addressed to SOURCE BBB343, CompuServe 71226,713, or MCI Mail 157-9301

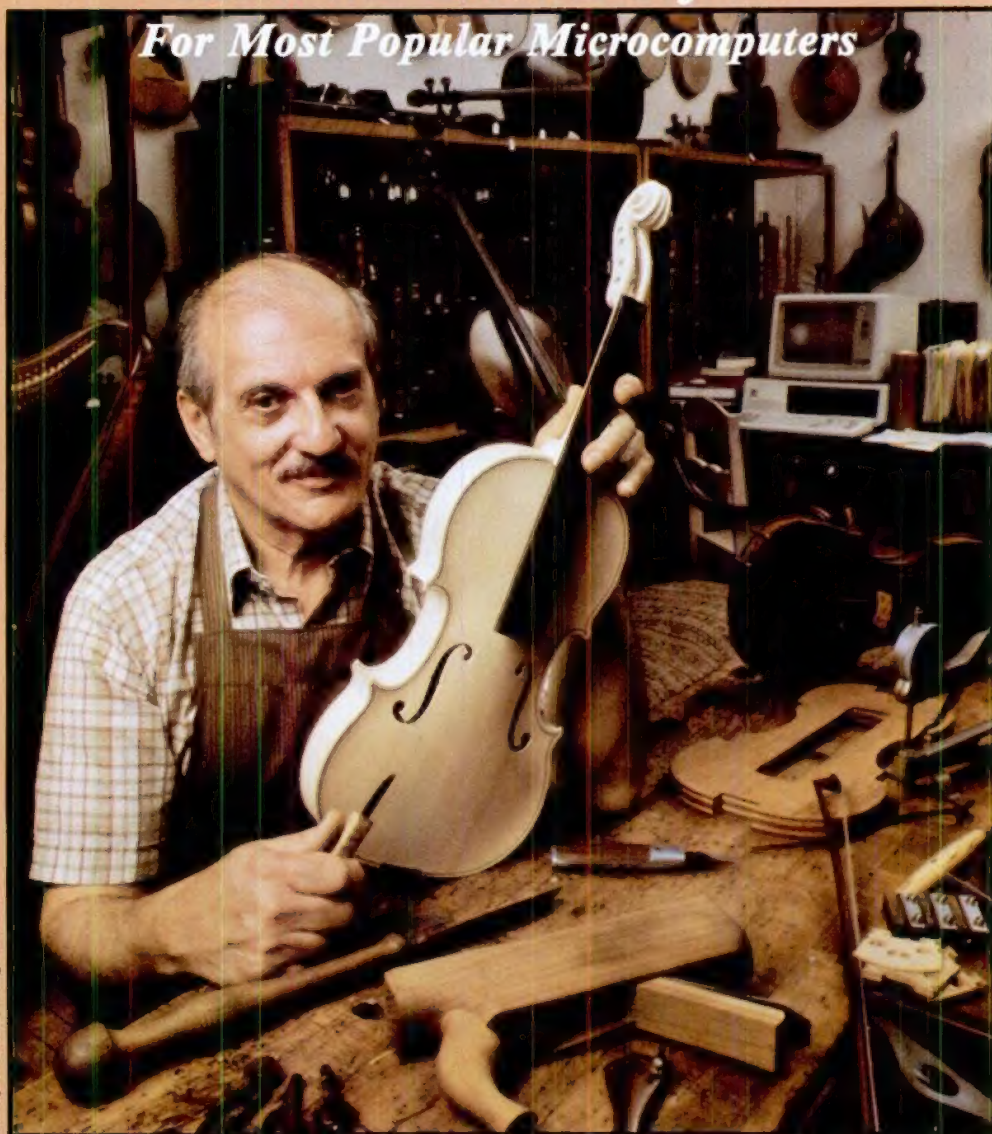


REALWORLD EXPERIENCE

THERE IS NO SUBSTITUTE

RealWorld™ Business Software

For Most Popular Microcomputers



Courtesy: Fred Over, Vintage Instruments

Photograph: Joseph Netis

ACCOUNTS RECEIVABLE ☐ ORDER ENTRY ☐ INVENTORY CONTROL
SALES ANALYSIS ☐ ACCOUNTS PAYABLE ☐ GENERAL LEDGER ☐ PAYROLL

Whatever the product or service, it takes experience to produce quality and lasting value.

There are no inexperienced master violin makers. And so it is with software.

The staff at RealWorld Corporation have been creating packaged software products for nearly ten years. During that time, over 40,000 users have kept us in touch with reality.

We don't sell "disposable software". We haven't tried for the fanciest packaging. We won't promise "anyone can master it in ten minutes".

Mature accounting software just isn't like that.

But we will say this:

If your accounting needs are typical, and if you are willing to invest the time to read and follow our clearly written instruction manuals, RealWorld Software can work for you.

Visit your local computer store for more information, or call one of our 800 numbers for the authorized reseller nearest you.

mbisi™ A Division of RealWorld Corporation

DOVER ROAD, CHICHESTER, NH 03263

603/798-5700 TOLL FREE: 800-255-1115

California: 800-441-1777 Western U. S.: 800-321-1777

CIRCLE 420 ON READER SERVICE CARD



**The Independent Guide to
IBM Personal Computers**

VOLUME 3, NUMBER 21
OCTOBER 30, 1984



COVER STORIES

Project Management with the PC 109

Ken Edwards/Presenting the first of our three-part series on project management software, a tool that can play a key role in planning, scheduling, and directing business projects.

CPM/PERT: A Good Introduction 118

Data*Easy Project Management: No Frills 120

Demi-Plan: Economy Exacts a Price 123

EMPACT: Low Cost and No Nonsense 125

EX-PERT/80: A Program for Smaller Jobs 128

Garland Pathfinder: Simple Schedules 131

Harvard Project Manager: Windows and a Roadmap 133



IntePert: A Well-Documented Winner 135

MicroGANTT: Nice Features, but Poor Design 137

MicroPERT: Project Management Analysis 139

MicroTrak: Strong for Small Jobs 142

Milestone: A Well-Crafted Planning System 145

FEATURES

WORD PROCESSING **Word Processing on a Budget** 160

Marilyn V. Fleming/A review of six inexpensive word processors that are comparable to the more costly programs on today's market.

MagicIndex and WordStar: **Word Magic!** 257

Glenn Hart/MagicIndex adds fancy features that can make your WordStar documents shine.

SOFTWARE **Super Software for Technical Investors** 173

George Hayles/Winning on Wall Street and The Technical Investor are excellent programs that will help you perform in-depth analyses of Wall Street trends.

HARDWARE **A Character Set for a More Readable Screen** 205

Laurence V. Marks/Complete these two soldering projects on your IBM Color/Graphics Adaptor if you would like to make the text on your monitor more readable. One creates a larger font, and the other adds a blank line between rows of text.

STM Brings Desktop Power to a Portable—Almost 226

John Helliwell/The STM PC possesses many good features and an innovative design. But, unfortunately, it has one problem too many.

THE PRICE WATERHOUSE REPORT **Sizing Up the Basic Four** 232

The MAI General Accounting series is a PC reincarnation of Basic Four's successful minicomputer software line.





page 232

PRO COLUMNS

SERVICES

A PC Congregation 287

Philip Siddons/A Presbyterian minister from Buffalo discovers the simple pleasures of creating sermons on the PC using *Multimate*.

BUSINESS

IBM PCs All Across America 291

Susan Wolbarst/Strout Realty, a rapidly expanding, conservative, grass-roots company, is planning to put PCs in every one of its 600 offices within the next two years.

EDUCATION

On-Line College 297

Alfred Glossbrenner/The New York Institute of Technology is the first university to offer full-scale college degree programs—on-line and off-campus.

MEDICINE

Psych Database 303

Thomas Droege/dBASE III eases the chaos of managing a psychiatric clinic in Durham, North Carolina by putting staff and patient records on-line.

PROGRAMMING

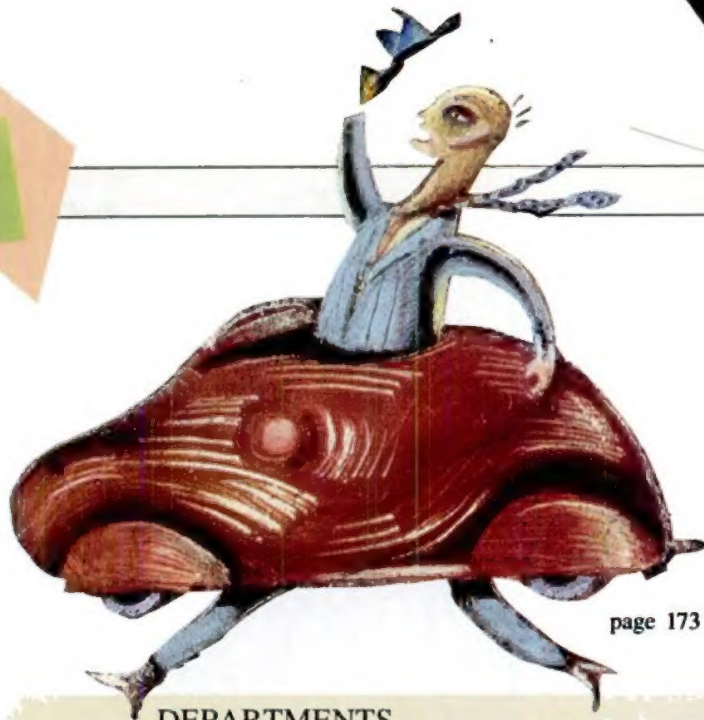
Custom-Made DOS Filters 337

Michael Abrash and Dan Illowsky/Presenting some procedures for PC-DOS users on how to modify and reassemble the CR/LF and MARKEOF filters to suit their own needs.

WRITING

PC-FILE-III Puts a Writer in Order 359

Martin Porter/A free-lance writer uses *PC-FILE-III* to organize his business records, deadlines, assignments, queries, and contacts.



page 173

DEPARTMENTS

WHAT'S INSIDE 15

PC NEWS 33

Twelve pages of up-to-the-minute reports, interviews, mini-reviews, and useful tips, as well as tales and fables from the computer community.

FROM THE EDITOR'S SCREEN

Naming the Rose 83

Bill Machrone/The PC AT by any other name would smell as sweet, but how was it named in the first place?

GUEST EDITORIAL

Bringing the PC to Life 89

John J. Walsh/It's time to explore the potential of voice synthesis and videodisk technology in business applications.

LETTERS TO PC 93

THE NORTON CHRONICLES

The Dissection of DOS 3.0 105

Peter Norton/Norton reviews the good, the bad, and the ugly of the new DOS 3.0.



PC ARCADE

Trolls and Snarks 273

Phil Wiswell/Two new adventure games for kids break the frustration barrier for younger players.

BOOK REVIEW

Kids and Computers: Advice for Parents 281

Robin Raskin/Computers often present parents with problems, but these three books come to their rescue with some solutions.

NEW ON THE MARKET 307

David Obregón/The latest in hardware, software, accessories, publications, and services for your PC.

CLUB NEWS 319

Jane Mintzer/Listings of dozens of IBM PC user groups.

PC BLUEBOOK 322

A quick-reference guide for PC owners and soon-to-be owners.

PC: MART 336

USER-TO-USER 344

Paul Somerson/PC owners share their tips and short programs.

PC TUTOR 349

Mark Zachmann/PC answers readers' miscellaneous technical and nontechnical questions.

PRODUCT INDEX 357

INDEX TO ADVERTISERS 369

COMING UP

PCjr. 364

PC Tech Journal 365

PC Disk 366

PC Magazine 371

Cover Photograph: Dennis Chalkin

The new HERCULES[™] Color Card gives you the parallel port IBM forgot-for \$1 more.



The new Hercules Color Card gives you these five important features in a color graphics card.

1. Full IBM color card compatibility.¹ Any program that runs on IBM's color card will run on the new Hercules Color Card at the same resolution.

2. A parallel printer port—standard on the Hercules Color Card, but forgotten by IBM on theirs.

3. It's short. The pint-sized Hercules Color Card fits in the short slot in an XT or *Portable*.² And it's AT[™] compatible.

4. It can work in your system at the same time as the famous high resolution Hercules Graphics Card.³ And it will continue to work backed by our 2 year warranty.

5. Low price. At a suggested list price of \$245, the Hercules Color Card is only \$1 more than IBM's card.⁴ And our Graphics Pak[™] saves you even more money when you buy both Hercules cards at the same time.

Call 800 255-5550 Ext 420 for the name of the Hercules dealer nearest you. See why the company that made the first graphics cards for the IBM PC still makes the best.

	IBM Mono Display Compatible	IBM Color Display Compatible	Hi-Res Text	720 × 348 Hi-Res Graphics	320 × 200 Color Graphics	640 × 200 B & W Graphics	Parallel Printer Port
Hercules Color Card		■			■	■	■
Hercules Graphics Card	■		■	■			■
IBM Mono Card	■		■				■
IBM Color Card		■			■	■	

Hercules.
We're strong on graphics.

Address: Hercules, 2550 Ninth St, Berkeley, CA 94710 Ph: 415 540-6000 Telex: 754063 **Foreign distributors:** Compuserve/Canada; Reflex/U.K.; Computer 2000/W. Germany; Edisoft/France; Imagineering/Australia; Holland Info Products/Holland; DataTeam/Scandinavia
Trademarks/Owners: Hercules, Graphics Pak/Hercules Computer Technology; IBM, AT/ International Business Machines **Notes:** (1) An adapter is supplied for composite video. (2) The IBM Color/Graphics Monitor Adapter must be removed from the *Portable* before the Hercules Color Card is installed. (3) Model GB101 or later. (4) Based on the list price as of 7.1.84 for the IBM Color/Graphics Monitor Adapter.

No other financial software even comes close.

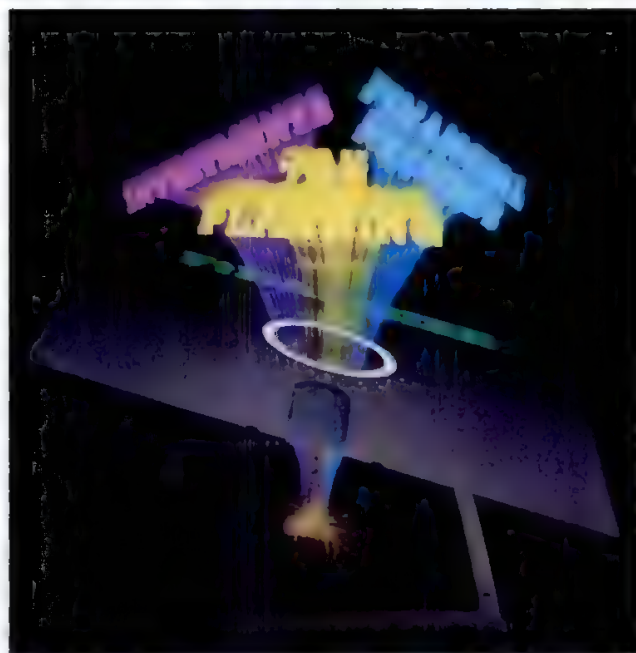
Now Financier II

The financial software that has met with resounding approval from professional software reviewers just got even better. Now, the Financier Personal Series has been upgraded to Financier II. Combined with Financier's Tax Series and Investor's Series, it creates a totally integrated financial management system. Financier II is so easy to use that it is ideal for personal finance yet powerful enough, and flexible enough, to function as a small business system.

"It is clear that the Financier Personal Series is the most sophisticated and flexible of the financial programs under review here."

Burton Alperson, Ph.D.
Reviewer, SOFTALK
June, 1983

Financier II features enhanced graphics capabilities, and expansion of Financier's unique auto-checking capability which prints checks directly from a user-maintained database, while updating bank, budget and tax records. Additionally, it provides a full range of professional-caliber financial statements including net worth, and cash flow reports. You can even opt for double-entry accounting methods, if desired.



Introducing Financier II

**Now you can have
a completely integrated financial
software system.**

"Out of all these programs," the Financier Personal Series provides the best balance of extensive capabilities and ease of use. The manual is outstanding as an introduction to both the practice of bookkeeping, and the use of a personal computer to perform this task."

Steven Yoder and
Sherry Knight, CPA
PC Magazine, February, 1983

Financier II is remarkably easy to use.

You don't have to be a computer whiz-kid to use Financier II. That's because it's menu-

driven. When you need to enter data, just fill in the blanks on the preformatted screen. If you can use an automatic teller machine, you're well on your way to mastering this unique financial software.

Another thing that puts Financier II so far in front of any other financial software package is that it offers powerful tax and inventory functions. In fact, Financier II allows you to maintain literally thousands of these accounts, if you desire. And, each account is separately manageable.

"Thus far, no other software company has matched Financier's interlocking combination of a powerful tax planning package (Tax Series) and a year-round record-keeping program (Personal Series)."

Augustin Hedberg
Money, June, 1983

Financier Tax and Investor's Packages.

Financier's Tax and Investor's Series provide the perfect adjunct to Financier II.

Financier's Tax Series lets you create multiple tax cases, and store them for later adjustment. You can even perform "what-if" spreadsheet calculations, generate graphics and print charts.

Financier's Investor Series is a comprehensive portfolio management system that lets you maintain a data base on each security account, each security position, and each security transaction.

Financier Offers Something for Everyone.

Individuals, businessmen, tax preparation specialists, investors or anyone who wants real financial control cannot afford to miss out on Financier's powerful software packages.

Get the most from your personal computer with the financial software that does the most. Financier II, and Financier's Tax and Investor's Series.

Financier Inc. 2000 West Park Drive, Box 670, Westboro, MA 01581 (617) 366-0950

*Apparant Home Finance™, Perlín™, PC/PFP™, Home Accountant Plus™, Financier Personal Series™

**Bonus Accounting System™, Financier Personal Series™, FMS II™, Home Accountant Plus™, Money Maestro™

Financier software is available for IBM® PC, IBM® XT, Digital Rainbow™ and Wang® PC

CIRCLE 241 ON READER SERVICE CARD

Can Your Word Processor Keep Up With Your 100 WPM Typist?

It can if you have WordPerfect!

Try this test. While using your favorite word processor, put the cursor in the middle of a paragraph, turn insert on, and type. Surprisingly, very few of the leading word processors can keep up with 70, 60, or even 50 words per minute. WordPerfect keeps up easily at speeds well above 100*.

Now, maybe this doesn't matter to you, because you don't type 100 or even 50 WPM. But you still don't want to wait forever to go to the beginning of your document, go to page 5, save your document, or add a paragraph.

At SSI anything less than fast is unacceptable. And not just because time is money, or because wasting time is foolish.



Delays are very frustrating, and frustration can easily lower the quality of your writing.

Try WordPerfect.

WordPerfect

**You'll love it—
not only for the
features we've built in,
but also for the
delays we left
out.**



*Based on tests performed on an IBM PC.

SATELLITE SOFTWARE INTERNATIONAL

288 WEST CENTER STREET, OREM, UTAH 84057 (801) 224-4000 TELEX 820-618

SSI

Of course you can't do seven things at once, but your computer can



...with WindowMaster™

Now your computer can handle up to seven applications at once with Window Master — the exciting, new multitasking, windowing system. Balance your books, perform spread sheet calculations, print your color graphics, and input information into your data base...simultaneously. WindowMaster integrates all the popular industry packages and allows them to exchange data. Let your computer work for you.

- Multitasking — runs MS™DOS and CP/M-86® applications concurrently
- Lets you use the software of your choice — Lotus 1-2-3™, WordStar™, dBASE™...
- Includes full business graphics — color or B/W bar, line, and pie charts
- Simple interwindow data transfer
- User-definable application menus
- Programmable function keys
- User-created "scripts" perform repetitive or complicated tasks.



Indian Ridge Enterprises
Incorporated

Retail 415/ **268-1488**

OEM 415/ **268-1631**

508 Second Street
Jack London Square
Oakland, CA 94607

Available for the IBM PC, XT, jr,* and true compatibles

CLEAR THE DESK, SIDEKICK'S HERE! *The Super Organizer*

ALWAYS JUST A KEYSTROKE AWAY . . .

No matter what software you're running!

WHETHER YOU'RE RUNNING LOTUS, WORDSTAR,
dBASE OR WHATEVER . . .

JUST A KEYSTROKE AND A SIDEKICK WINDOW OPENS . . .

- A CALCULATOR
- AN APPOINTMENT CALENDAR
- A NOTEPAD
- AN AUTO DIALER
- A PHONE DIRECTORY
- AN ASCII TABLE



INTRODUCTORY OFFER

\$49.95

Copy Protected Version



Here's Sidekick in action. That's Lotus 1-2-3 running underneath. In the Sidekick Notepad you can see data that's been imported from the Lotus screen. On the upper right, that's the Sidekick Calculator.

Alt: (C2) 400

REVENUE		EXPENSES	
Sales	\$440.00	Cost of Materials	\$20.00
Royalties	\$55.00	Rent	\$5.00
Other	\$15.00	Advertising	\$45.00
TOTAL REVENUE	\$510.00	Total Expenses	\$70.00
		Net Profit	\$440.00

Alt: 1:39:23 9/14/1994

EXPENSES	
Cost of Materials	\$20.00
Rent	\$5.00
Advertising	\$45.00
Salaries	\$35.00

Alt: 1:39:23 9/14/1994

EXPENSES	
Cost of Materials	\$20.00
Rent	\$5.00
Advertising	\$45.00
Salaries	\$35.00

Alt: 1:39:23 9/14/1994

NOW . . . Whether you're working in dBase, Lotus, Wordstar or whatever . . . you can unleash the full power of your computer . . . and make a lot of extra space on your desk at the same time.

Whenever you're using your computer . . . from start to finish of your session . . . Sidekick™ will be there . . . ready to serve. And it's as lightning-fast and compact as only Borland knows how to make it.

There's a notepad that has a full-screen editor that can time and date stamp your notes, and then save them to disk. You can even pull information into the notepad directly from the screen of your "underlying" software.

Suppose you're working in Lotus and the phone suddenly rings. Give your Sidekick a call and it pops right up over Lotus with the notepad you need. Or an appointment calendar . . . one you can never misplace.

What if you need to do a quick calculation? A keystroke instantly brings up the calculator. And the results of your calculations can even be transferred to your "underlying" software.

Need to make a phone call? Up pops your personal phone directory. Type in the name you want . . . and Sidekick jumps right to the phone number. Another keystroke, and the phone is automatically dialed for you.†

There's lots more, too. You can move the Sidekick windows anywhere on the screen you like. And you can have as many on screen at a time as you need. There's even an on-line help window for each of Sidekick's features.

We designed it because we needed it. If you've ever been writing a report and needed to do a quick calculation, or jot down a note, then you need Sidekick, too.

†Only with Hayes Smartmodem and compatibles.

GOT YOUR SIDEKICK YET?

YOU CAN ORDER YOUR COPY OF SIDEKICK™ TODAY!

For VISA and MasterCard orders call Toll Free 1-800-255-8008 in California 1-800-742-1133

(lines open 24 hours, 7 days a week) Dealer Distributor Inquiries Welcome 408-438-8400

SIDEKICK™ \$49.95 ☐
Non-copy protected
Version: \$79.95 ☐
(Plus \$5.00 shipping
and handling.)

Check ☐ Money Order ☐
VISA ☐ MasterCard ☐
Card # _____

Expiration Date _____

*PCjr runs non-copy protected version only.

Please be sure your computer is an IBM PC, XT, jr., or true compatible!

NAME _____

ADDRESS _____

CITY/STATE/ZIP _____

TELEPHONE _____

California residents add 6% sales tax. Outside U.S.A. add \$15.00. (If outside of U.S.A. payment must be by bank draft payable in the U.S. and in U.S. dollars.) Sorry, no C.O.D. or Purchase Orders.

**BORLAND
INTERNATIONAL**

Borland International
4113 Scotts Valley Drive
Scotts Valley, California 95066
TELEX: 172373

Somebody has to be better than everybody else.

It's inevitable.

Somebody is always more determined. Works harder. And winds up on top.

Take Dysan, for instance.

We were the ones who helped develop the first 5¼" flexible diskette.

And while everybody else was trying to figure out how to make them, we were busy making them better.

With superior materials. A special lubricant and jacket liner that extend diskette life.

Unique manufacturing techniques. Like our burnishing process that helps eliminate read/write errors.

And an almost fanatical corporate commitment to quality.

What does all this mean to you?

Every Dysan diskette you buy will record and retain all your data all the time. For as long as you own the diskette and treat it right.

Dysan.

We're not just like everybody else.

Dysan 5¼" and 8" flexible diskettes are available at your computer products dealer.

Call toll free for the name of the Dysan dealer nearest you. (800) 551-9000.

Dysan Corporation, 5201 Patrick Henry Drive, P.O. Box 58053, Santa Clara, CA 95050, (408) 988-3472.

Dysan®





What's Inside

An office-wide change in word processing programs creates enough confusion to make this issue's cover package on project management programs seem like a great idea.

One of the great disadvantages of good software is how it can grow on you. A good package becomes as close to you as, say, your favorite pair of Calvins; even after styles have changed and you have found a much more attractive and useful pair, you are still incredibly reluctant to throw out the old.

Well, for the past year or so, the *PC* editorial staff has been writing its deathless prose using a very well known word processing package. The name of this program isn't particularly important; nor is how it got into our offices to begin with. But it soon became the unofficial *PC* word processor.

We were very fond of this program and were not at all shy about advertising our romance to friends and colleagues. New staff members were given copies of the software almost before their microcomputers appeared; informal workshops were held over morning coffee on *The Best Way To Connect Files*, and writers who sent in their manuscripts using other programs were viewed with ill-concealed contempt.

A Word Processor Shakeup

However, in the usual manner of powers that be, a pronouncement came through one day that shook the very foundations of the editorial department.



For certain very good reasons, the official word processing program of *PC Magazine* was going to be changed. Word processor A was almost immediately abandoned, never again to darken our doors. Word processor B was now the order of the day.

A few days later, copies of word processor B were dumped unceremoniously on desks, and memos were distributed explaining politely that staff members were "requested" to learn the new software. In a short time, confusion reigned—at least temporarily.

Formerly blasé editors now spent a great deal of their time running into colleagues' offices asking pitifully, "Why

can't I find half of my file?" Deadline schedules went by the board as writers attempted to shed habits so ingrained that they would have put Pavlov's dog to shame.

In fact, this column was written under those perilous circumstances. The editor who writes this column usually views "What's Inside" as a last-minute, is-it-due-already? task, and so a minimum of time was allotted to its creation. That minimum was badly strained as the unfortunate wordsmith spent hours trying to unravel such mysteries as why the screen blanked out every time she invoked the underline utility.

Project Management

With that problem added to our usual chaos, it was no wonder that we decided to do a cover story on project management software. Those of you who have been reading this column for any length of time will be familiar with the pandemonium that usually surrounds our major product rundowns. While the final result is always something to be proud of, the number of incipient ulcers acquired in the process is alarming.

Project management software is supposed to help with that. These programs are modeled after classic planning strategies used by most corporations to make sure that they allocate funds properly,

WHAT'S INSIDE

use time efficiently, and meet deadlines. Given the appropriate information, these programs will (depending on their level of sophistication) organize data, place

them into charts that illustrate various steps needed before the project is completed, adjust dates and cost estimates according to "what if" scenarios, and

even integrate the schedules of several projects at once.

Since most of the editorial staff was involved in more important things (like learning how to quit their new word processors without losing all their files), we decided to recruit Ken Edwards to head up the project. Edwards, a manager at Touche-Ross, a Big Eight accounting firm, together with assistant Lynne Baron and in liaison with PC associate editor Barbara Krasnoff, planned and put into

HOW DARE SBT GIVE AWAY ITS SOURCE CODE!



The Secret's Out

Most software companies keep their source code top secret. (The source code is the set of commands that make a computer perform a given task.) But SBT doesn't keep any secrets—instead we freely give away our dBase Accounting Source Code so you get the control and flexibility that's crucial to a well run business.

When there are no secrets, you can add a special part number system or change a report at will—the possibilities are endless. That's why SBT Accounting Software can change and grow with your business needs. You can make the changes yourself or SBT will do it for you quickly and inexpensively.

Integrated or Stand Alone

Start with the modules you need now, and add the others later. Best of all, SBT Software works on all computers that can run dBase II or dBase III.

.dOrder	Sales Order Processing	\$195
.dInvoice	Billing/Inventory Control	\$195
.dStatement	Accounts Receivable	\$ 95
.dPurchase	Purchase Order Processing	\$195
.dPayable	Accounts Payable	\$295
.dPayroll	Payroll/Labor Accounting	\$395
.dLedger	General Ledger/Finance	\$395
.dAssets	Asset/Depreciation	\$195
.dProject	Project/Job Accounting	\$345

Demonstration disks available.

Call SBT at 408-980-8880 for more information.

SBT Corporation
1140 Mountain View-Alviso Rd.
Sunnyvale, California 94089

*dBase II and dBase III are registered trademarks of Ashton-Tate.
See us at the PC Faire - booth #407



Project management software is supposed to help you allocate funds and meet deadlines.

execution the three-part series that begins in this issue.

Word Processing Redux

And just in case the powers that be change their minds again, we've included Glenn Hart's "Word Processing on a Budget," in which he reviews six programs (*Friendly Writer*, *Personal Editor*, *QUICK-TEXT*, *QUICK-TEXT II*, *The Word Worker*, and *I-EDIT*) that will let you type away happily for under \$100 each. Not satisfied with that, we've also added his overview of *MagicIndex*, which helps add a large variety of bells and whistles to your *WordStar* documents.

Meanwhile, for those who have extra cash to invest, George Hayles examines two investment programs that help Wall Streeters examine trends and make informed financial decisions.

So you can see that, in spite of our resistance to the new word processors, we have once again pulled together an eminently readable issue.

(Now, how do I get this program to save my file? Maybe if I press this function key

CIRCLE 470 ON READER SERVICE CARD

Minis and mainframes have used WordMARC for four years. Now there's WordMARC word processing for your micro.

Originally created for minis and mainframes, WordMARC is now available for use on your micro*. And quite simply, it's the best office-quality word processing software package a micro user could buy. After all, it was the best word processor mainframe and mini users like universities, national laboratories, and Fortune 500 companies could find over the last four years. But, if you need more proof, read on.

☐ *No Problems, No Nonsense, No Competition.* For starters, every-

thing you see on your screen appears exactly as it will be printed on paper. Scientific notation. Foreign lan-

guage characters. Underlining. Subscripts. Everything. ☐ *A Partial List of Features. That's Right, Partial.* Menu driven w/function keys. Easy self-

paced tutorials. Spelling checker. Mail merge. Scientific notation. Foreign lan-

guage characters. Automatic reformatting. Automatic pagination. Document recovery system. Document encryption. ASCII file handling. And so on. ☐ *If Word*

Processing's Your Call, Call 800-831-2400.

Granted, just because the call is free is no reason for picking up the phone. You should stop and consider

our track record with minis and mainframes.

You should stop and think what that can mean for your micro. And you should stop thinking about any other word processing software. OK. Now that you've done that, it's time to pick up the phone.

*WordMARC is compatible with the IBM PC or XT, as well as the Eagle, Compaq, Corona, NCR PC, DEC Rainbow, and TI Professional computers. All versions of WordMARC on micro, mini and mainframe computers are compatible.



MARC Software International, Inc.
260 Sheridan Avenue, Suite 200
Palo Alto, California 94306
800-831-2400 ☐ In Calif., 800-437-9900

*WordMARC is a trademark of MARC Software International, Inc. © 1984 MSI, Inc. IBM PC and XT, Eagle, Compaq, Corona, NCR PC, DEC Rainbow, and TI Professional Computers are trademarks, respectively of International Business Machines Corporation, Eagle Computer, Inc., Compaq Computer Corporation, Corona Data Systems, Inc., NCR Corporation, Digital Equipment Corporation, and Texas Instruments.



SURPRISE! A PER THAT WON'T SURPR

The NCR PC 4 is everything you'd expect from one of the largest computer companies in the world.

It's a personal computer that's easy to use, reliable, versatile and elegantly designed.

So you get all the advantages a personal computer should have. And no unpleasant surprises.

SOFTWARE, SOFTWARE, EVERYWHERE.

The NCR PC 4 is compatible with thousands of programs available at computer stores everywhere. From the best-selling Lotus 1-2-3™ to all sorts of other business programs, educational programs, or just plain fun programs.

IT'S COMPATIBLE WITH PEOPLE, TOO.

You'll get along with this computer the moment you take it out of the box. There are no complicated wires or clumsy boxes to set up. All you



PERSONAL COMPUTER USE YOU.

have to do is plug it in and you're ready to go.

The keyboard is designed to help you work faster and with fewer strokes.

To make things easier still, we include two special self-teaching programs.

One is called NCR PAL. It shows you, step by step, how to use the computer itself.

NCR TUTOR introduces you to the operating system as well as to word processing, spreadsheets and other popular business applications.

YOU WON'T OUTGROW THIS ONE.

The NCR PC 4 can grow as your needs grow. Our basic model, for instance, starts you out with enough memory to run most popular programs. Then you can easily add more. Up to 640K.

You can also add printers, a modem for telephone communications, a mouse, and

many other industry standard accessories.

For larger businesses, the NCR PC 4 networks with other computers, including mainframes.

WE'LL BE THERE WHEN YOU NEED US.

While the NCR PC is exceptionally reliable, it's nice to know that if it ever needs service you've got a big company like NCR behind it.

Our dealers have the backing of our extensive service organization, one of the largest and most experienced in the world.

The NCR Personal Computer looks better the closer you look into it.

So look into it closer at your nearest Authorized NCR Personal Computer Dealer.

We think you'll be pleasantly unsurprised.

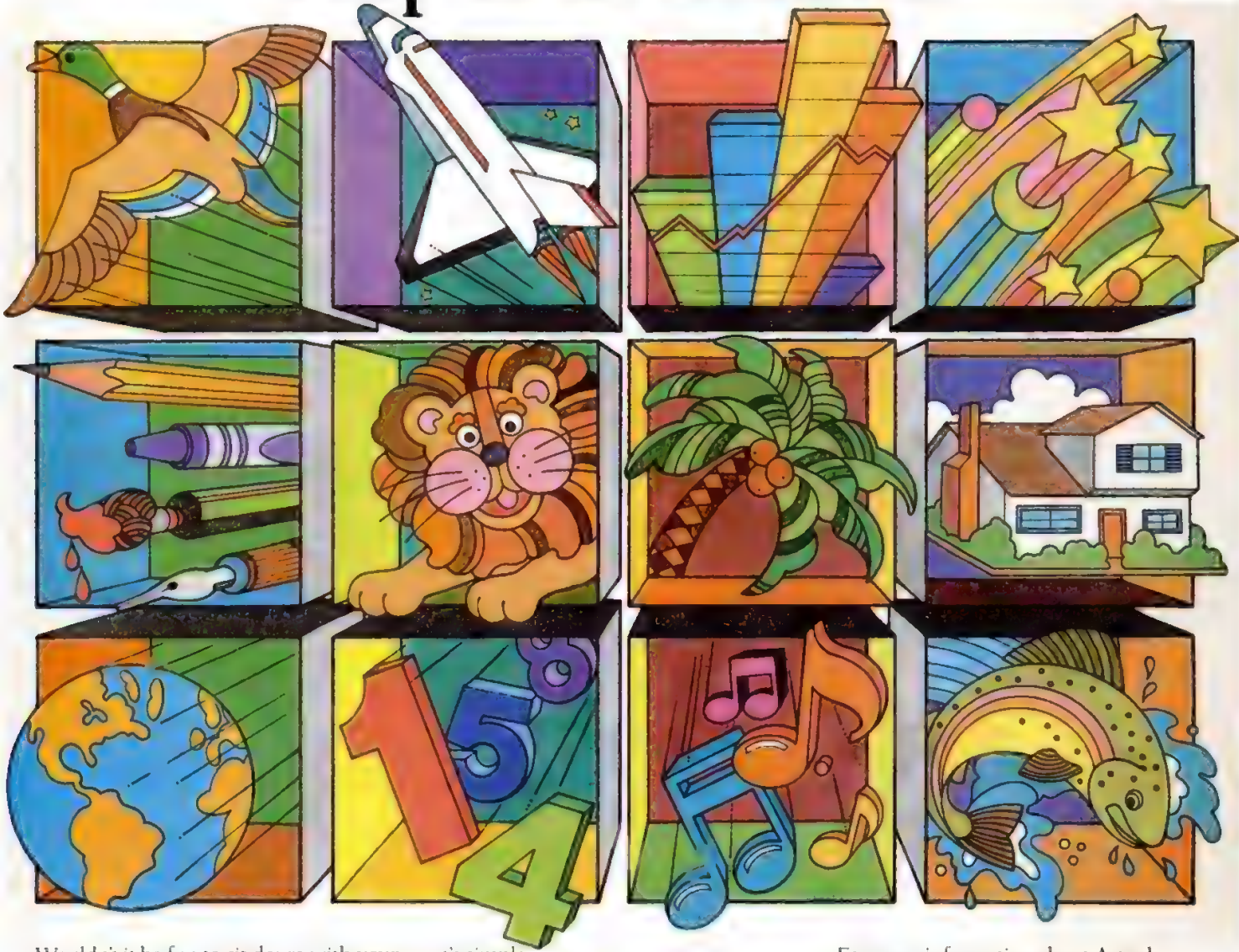
For the name of your nearest dealer, call toll-free: 1-800-544-3333.*



**A BETTER PERSONAL COMPUTER
IT'S EXACTLY WHAT YOU'D
EXPECT FROM NCR.**



Design little creatures, draw floorplans,
create animated cartoons, illustrate stories,
illuminate graphs, make crazy doodles,
and paint the screen red.



Wouldn't it be fun to sit down with your family tonight and create a full-length cartoon—right on your computer screen?

Introducing Artpak. There's nothing in the world like it.

It lets you draw anything you can dream up—and make it flip, dissolve, turn, blink, and disappear. In color!

Then, believe it or not, you can write your own musical score. Got the picture?

And you don't have to be an expert—in computers or art—to have a ball with Artpak. It's so sophisticated,

it's simple.

When you want to get serious you can use Artpak to create business presentations, flowcharts, diagrams, graphics and architectural layouts. Then print them all out.

However, we maintain that you should own Artpak simply because it's so much good, old-fashioned creative fun.

But you can draw your own conclusion.

Available for: IBM PC/XT and PCjr

Price: \$99

For more information about Artpak and the location of your nearest Artpak dealer, call us today.

Artpak™
PalSoftware Corp.
6100 Barrows Dr.
Los Angeles, CA 90048

213/259-9659 213/936-7707

PAL SOFTWARE

Artpak is a registered trademark of PalSoftware Corp. IBM PC/XT/PCjr are registered trademarks of International Business Machines Corp.

CIRCLE 540 ON READER SERVICE CARD

Catch

Trivia FeverTM

**"The Hottest
New Game In Town"**

Trivia Fever is absolutely unique — it's the only software entertainment package that can be enjoyed **with** or **without** a home computer! When played on your home computer, Trivia Fever is a refreshing alternative to all those shoot'em up games. An elected "Master of the Game" uses the computer to randomly select subject categories, handicap players, generate questions and answers, keep score automatically, and more! Instructive by its very nature, Trivia Fever can be enjoyed by up to 8 individuals or teams. And when played without a computer, Trivia Fever has all the best features of the "popular" trivia games plus more — all without the cumbersome board, cards, and little game pieces. You can play in a car, on vacation, anytime, anywhere! And Trivia Fever is by far the best Trivia game available anywhere. Here's why:

Trivia Fever offers thousands of challenging questions in 7 interesting categories, so there's something for everyone. Each category has questions with 3 levels of difficulty, which score comparable points. What's more, Trivia Fever allows players to HANDICAP all those so-called "trivia experts" three different ways, giving everyone a chance to win. And players can easily control the length of play from quick thirty minute games to multi-hour party marathons!

Trivia Fever is unique, entertaining, educational, and most of all FUN. And at \$39.95, Trivia Fever is destined to quickly become the best selling software entertainment package of all time. There's even a \$5 rebate available to any non-computer users who return the computer diskette.

Trivia Fever can be enjoyed on the Commodore 64, IBM PC & PCjr and compatibles, Apple II series, and others. So don't delay. Catch Trivia Fever at your favorite software retailer today!

For additional information call 617-444-5224, or write to:



PSI

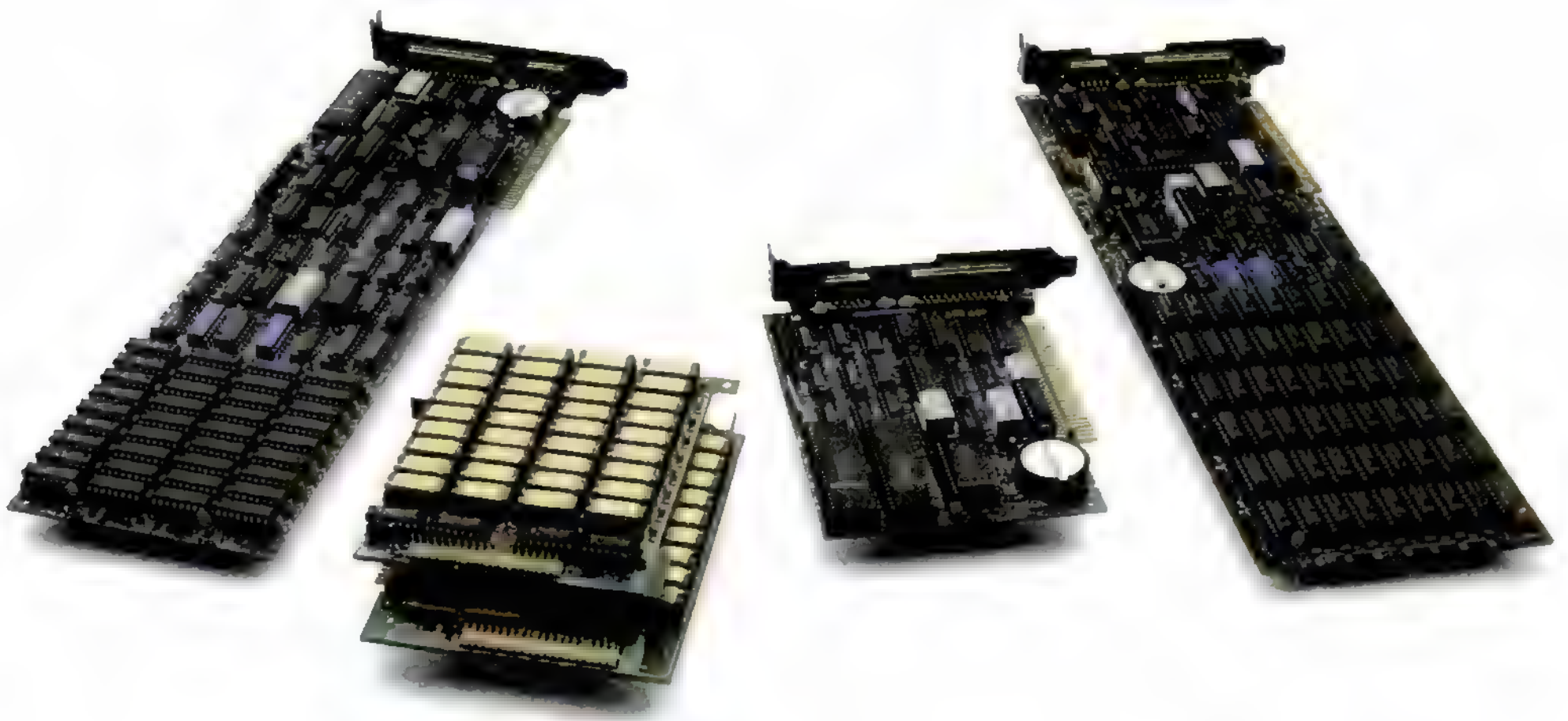
P.O. Box 533
Needham, MA 02194

Trivia Fever is a trademark of Professional Software, Inc.

At \$39.95, Trivia Fever comes complete with Question and Answer Book, Category Selector, and Tally Sheets to be used when played without a computer.

CIRCLE 374 ON READER SERVICE CARD

**We have the
missing pieces for
your IBM PC.**



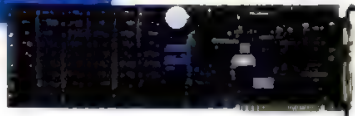
IDEA Multifunction Boards. Across the board, we're the best combination of performance and price.

Performance and price. Until now, when you went shopping for multifunction boards, you had to settle for one or the other. IDEA gives you the best combination of both.

IDEAmax 384

The unique backplane of our IDEAmax 384 multifunction board allows you to cable interfaces directly from the back of the board. Our competitors make you thread cable through adjacent slots. This limits valuable space in your PC.

New Lower Price: \$325.

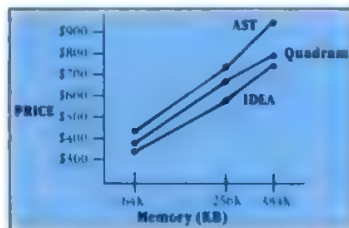


But, more importantly, why pay \$50 to \$200 more for our competitors' boards when the IDEAmax is only \$325 at the same fine stores?

And that price buys you 64K, parallel port, serial port and clock/calendar options. Plus, a game port and a total of 384K memory are also available with IDEAmax. And, best of all, every IDEAmax 384 is backed by the best quality and support in the business. As your needs expand, the unique IDEA upgrade policy gives you credit for your initial purchase when you're ready to trade up. No one else in the business makes you that offer.

All new software that's free

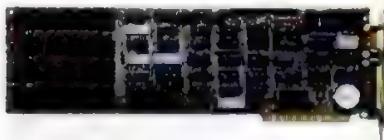
IDEAmax 384—and every IDEA multifunction board—comes with a library of free software programs, including IDEAmenu, RAMfloppy Disk Emulation, Printer Spooler, Printer Selection, Clock Routine, and Diagnostics.



(Based on published manufacturers' retail prices)

IDEAplus

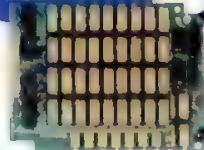
This is our unique host adapter board for the IDEAdisk Plus. We've improved our reliable IDEAplus so that you can boot directly from the hard disk and add 256K, serial, and clock options without using an additional slot.



IDEA Minimax

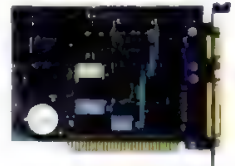
Designed specifically for the IBM Portable short slots, IDEA Minimax gives you 384K memory in a double decker configuration. Better yet, IDEA Minimax takes only one slot, saving your valuable long slots for other enhancements. Don't buy an XT or Portable without it. From \$325 (with 128K RAM).

And now for the IBM Portable!



IDEAmini

Now our versatile I/O short card for the PC and XT fits into the short slots of the IBM Portable. IDEAmini gives you a choice of two serial ports, parallel port, and clock/calendar. And IDEAmini is specially designed to link four PCs in our IDEAshare resource sharing network. Plus, you get our same great software and support. From \$195.



Ask for IDEA multifunction boards at Math Box, Computer Depot, Amerisource, Schaak Electronics, and Northeast Computer stores, as well as many other locations. Call **800-257-5027** for the IDEA store nearest you.

IDEA. The best idea *since* the IBM PC is the best idea *for* the IBM PC.

IDEAassociates

The best IDEAs for personal computers.

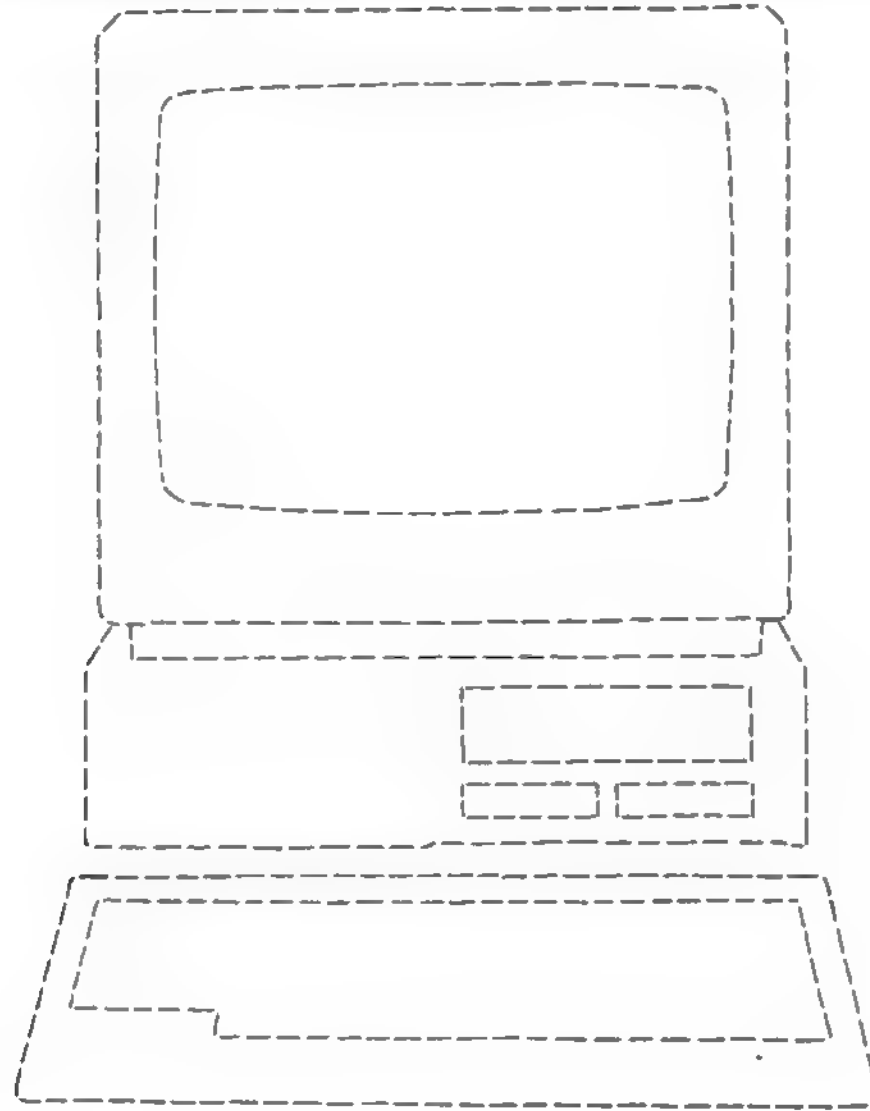
IDEAssociates, Inc. 35 Dunham Road, Billerica, MA 01821 (617) 275-4430 Telex 94-8245.
IDEAssociates S.A. 5, Route de Chêne, CH1207 Geneva, Switzerland (22)86 11 19 Telex 428 388 KBSCH



IBM and the IBM logo are registered trademarks of International Business Machines Corporation. IDEAmax 384, IDEAmenu, IDEAmini, IDEA Minimax, IDEAplus, IDEAdisk, and IDEAdisk Plus are registered trademarks of IDEAassociates, Inc.

CIRCLE 334 ON READER SERVICE CARD

**Picture a computer under \$1000
that runs over 1000 of the best programs
written for the IBM PC.**



Now picture this.

There's a lot that's new about PCjr and it's all good news for you.

PCjr now has a lower price. A new typewriter-style keyboard.

A new option that can give

user memory a dramatic boost.

And new business and personal programs to add to its fast-growing library of up-to-date programs.

All of which can make PCjr the most useful computer a little money can buy.

It comes standard with 128KB of user memory — twice the memory of its most popular competitor. An advanced 16-bit processor. And a double-sided diskette drive that can store over twice as much information as most single-sided drives.

With all these features, PCjr can run over a thousand of the most popular programs written for the IBM PC. And with the new optional 128KB Memory Expansion Attachment,

it can run over a thousand more.

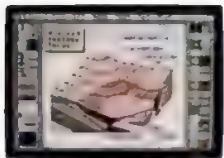
PCjr also runs a growing number of powerful cartridge programs. They work faster than



Right now, PCjr can run the powerful Lotus 1-2-3™ on diskette (with Lotus 1-2-3 PCjr Installation Kit and additional memory). The new cartridge version, requiring no additional memory, will be available this fall.



Managing Your Money™ by Andrew Tobias, new on cartridge for PCjr, is a comprehensive personal financial advisor and manager.



Turn your screen into a canvas. The new cartridge program, PCjr ColorPaint, lets you create with the added dimension of color.



diskettes, and don't take up a bit of user memory. The three newest examples being Lotus 1-2-3,™ the fascinating PCjr ColorPaint and Managing Your Money™ by financial expert Andrew Tobias.

As its library of software keeps growing, PCjr keeps growing, too. By leaps and bounds. Because IBM designed it with 13 ports for add-on options. And a modular construction that will accept new capabilities down the road. Even those that haven't been invented yet.

All this in a

computer that weighs a mere 10 pounds.*

Takes up just a bit over a square foot of desk space. And costs less than \$1,000†.

without monitor. Picture yourself with a PCjr. Try one out and see what's new at an authorized IBM PCjr

dealer or IBM Product Center.

For the name of the store nearest you, call 1-800-IBM-PCJR. In Alaska and Hawaii, call 1-800-447-0890.

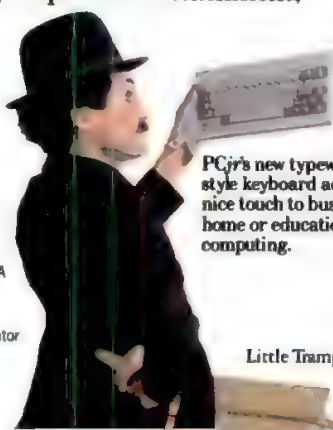


The new PCjr Memory Expansion Attachment can give memory a quick lift to 256KB. Or, along with a PCjr Power Expansion Attachment, all the way to a hefty 512KB.

More computer for your money.

See how PCjr compares with other computers at its price.

Memory	Software
User Memory (RAM) 128KB (expandable to 512KB)	Runs over 1,000 programs written for the IBM PC
Permanent Memory (ROM): 64KB	Runs both diskette and cartridge programs
Diskette Drive	Display
Double-sided, double density	40- and 80-column Resolution
Capacity 360KB	4-color: 640h x 200v
	16-color: 320h x 200v
Processor	Expandability
16-bit 8088	Open architecture
Keyboard	Optional 128KB Memory Expansion Attachment(s)
Typewriter-style	13 ports for add-ons, including built-in serial interface
Detached; cordless	
Warranty	
1-year limited warranty	



PCjr's new typewriter-style keyboard adds a nice touch to business, home or educational computing.

IBM PCjr

Growing by leaps and bounds.

CIRCLE 192 ON READER SERVICE CARD

Managing Your Money is a trademark of MECA. 1-2-3 and Lotus are trademarks of Lotus Development Corporation.

*Weight does not include power pack and monitor.
†IBM Product Center price.

Little Tramp character licensed by Bubbles Inc., s.a.



MICRO MART's SMART GUIDE for the Purchase of YOUR IBM-PC

Go out and get your best deal on a minimally configured IBM-PC from an authorized dealer. (64K with one floppy disk). Or choose one of the fine compatibles, which we stock. Now call the PC Professionals at Micro Mart. That's right, Micro Mart, the fastest growing chain of computer centers in the South.



We have the experience, product knowledge and availability that only a centralized national support organization can provide —

all at top value pricing, complete with great service and technical support.

Let our fully trained technicians install your enhancements, from high performance boards to floppy disk drives. Either way you'll be glad you called on Micro Mart



to tailor design your PC System to your exact specifications, always at Your Best Price along with Expert Advice. Plus be confident in our Factory Authorized Service and Tech Support (in full cooperation with our manufacturers). *We also offer complete extended service agreements nationwide.

Call Toll Free for the Micro Mart Computer Center Nearest You

ATLANTA

404-956-8088

404-449-8081

CHARLOTTE

704-568-7470

FT. LAUDERDALE

305-749-0330

TAMPA

813-972-5000

LOUISVILLE

502-895-5624

WASHINGTON, D.C.

301-294-9000

MICRO MART

Micro Mart Headquarters

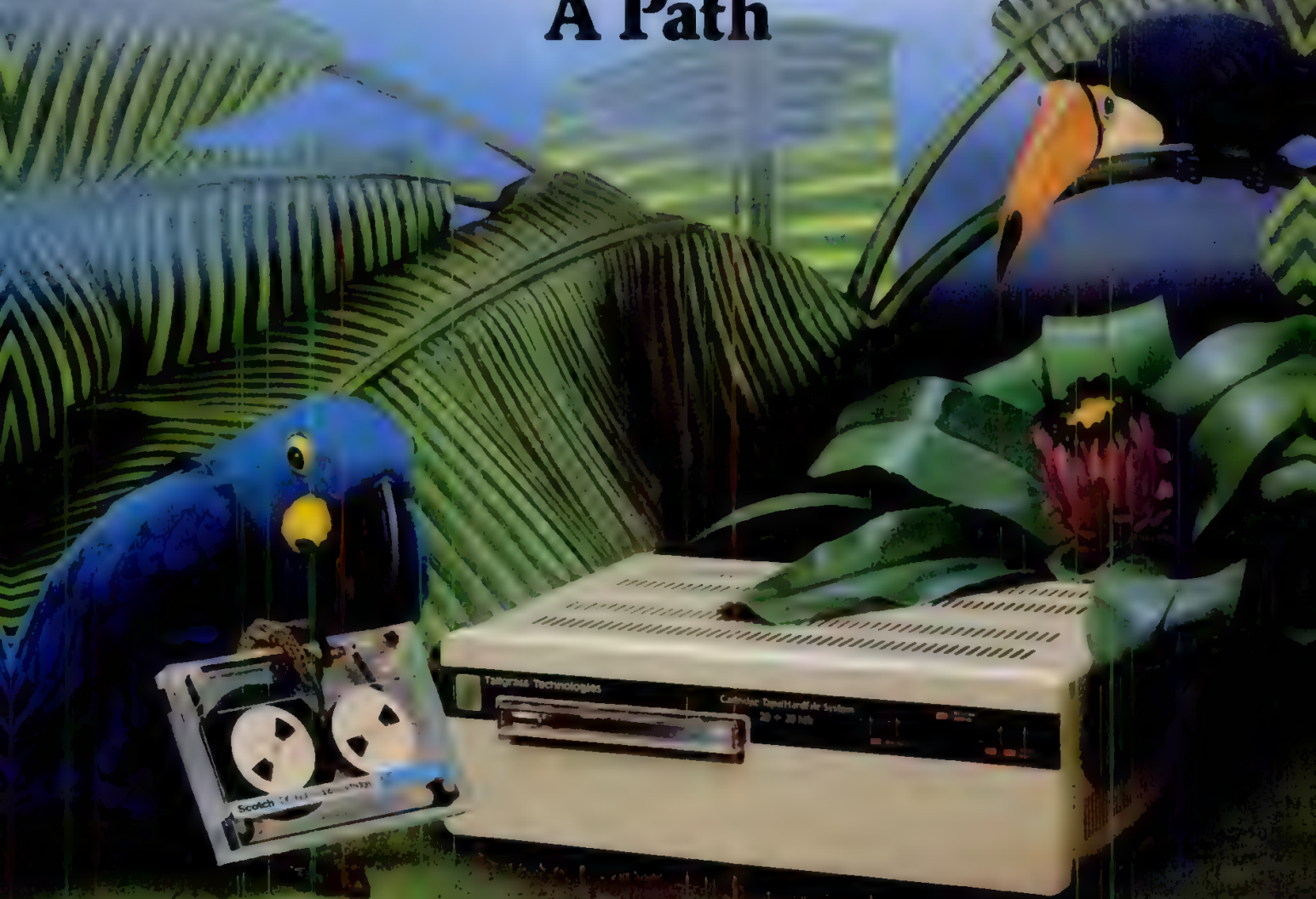
3159 Campus Drive, Norcross, GA 30071

800-241-8149

For Information—404-449-8089

**SHOW OUR ADS TO YOUR
PURCHASING AGENT, PLEASE**

In the Hard Disk Jungle Tallgrass Clears A Path



In today's hard disk jungle, Tallgrass clears a path by offering high performance, integrated mass storage solutions for the IBM® PC/XT, the T.I. Professional and related computers.

TALLGRASS INNOVATIVE FEATURES

MASS STORAGE SYSTEMS with formatted HardFile™ capacities of 6, 12, 20, 35 and 70 Mb, all with built-in tape backup.

CONVENIENT INTEGRAL TAPE BACKUP SYSTEM allows rapid tape "image" streaming, or incremental file-by-file backup and restore on ANSI standard inexpensive data cartridges, instead of the usual floppies, video cassettes, or low-capacity removable Winchester devices.

NETWORK READY and fully compatible with networks such as PCnet® and EtherShare™.

HIGH RELIABILITY with dual directory and read-after-write verify options. A dedicated landing zone, where the read/write heads reside when the disk is idle, provides data protection during powerdowns and transportation.

Follow the Tallgrass path to your local computer dealer and watch your personal computer transform into a powerful data processing system.

Available from COMPUTERLAND® Entré® Computer Centers, MicroAge® Computer Stores and other participating computer dealers.

New! IBM-XT Cartridge Tape Backup

World Headquarters: Tallgrass Technologies Corp./11100 W. 83rd St.
Overland Park, KS 66224/913/492-6002/Telex: 307406 THTT US

Canadian Headquarters: Tallgrass Technologies (Canada) Ltd./350 Silverdale Drive
Mississauga, Ontario, Canada L4V 1T8/416/273-3344

European Distributors: CDS Computer Group, Ltd.
Westborough, England GU24 0ET/(0223) 207200

Australian Headquarters: Tallgrass Technologies (Australia) Pty. Ltd./Dock Plaza
Suite 12/30 Great North Road/Pyre Dock/Sydney, N.S.W. 2040/02 522 2000

CIRCLE 445 ON READER SERVICE CARD



**Tallgrass
Technologies**
Corporation

Your PC and Compucart: Smart!

See us at
COMDEX/Fall '84
November 14-18, 1984
Las Vegas Convention Center
Las Vegas, Nevada

You own a personal computer, or you are planning to buy one. Smart!

Once you have seen the COMPUCART and studied our technical drawings, you will understand why it has become popular among major corporate executives and why it is the Smart place to put your PC.



ONLY COMPUCART:

- ① Holds a complete PC system, including 132 column printer, a full box of paper, manuals, software, and still has room for expansion in a space approximately 2 feet square,
- ② Adjusts horizontally and vertically to suit your individual needs,
- ③ Cools your PC and quiets your printer,
- ④ Rolls easily wherever you need it, and
- ⑤ Locks securely with your own key
- ⑥ Locking back door*

Ask about other options to make learning and using your PC easier and more productive. You can work smarter with...

COMPUCART, "The SMART CART"!

*optional

COMPUCART®

Pat.
Pend.

• Mfg. by Versa Tec Corp
• GSA Scheduled Item

• Main Plant: Tampa, FL Also New York City & Los Angeles, CA
• P.O. Box 2095, Tampa, FL 33601-2095 Tel (813) 251-2431

• Dealer Inquiries Invited

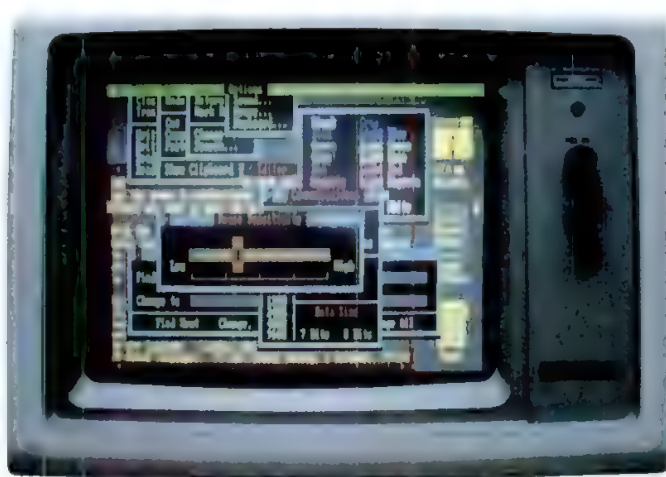
• CALL TOLL FREE 1-800-237-9024

CIRCLE 199 ON READER SERVICE CARD

We thought about calling it MacSimplex . . . after all it makes your IBM® PC behave like a Macintosh™ and much more . . .

and with over two years in the making, the Simplex Database Management System has features like 32-megabyte virtual memory and the most powerful networked/relational database in the microcomputer industry. Simplex was designed around how you think and the Macintosh way, so that you can use your favorite mouse to handle those mundane tasks like menu selection and data manipulation. And, if you don't have a mouse, you can use our keyboard mouse simulator, MouSim™.

Pop-up and pull-down menus, dialog and alert boxes are not just added features, they are the heart of the Simplex way. In addition, Simplex gives you both a software and a hardware floating point capability, each with 19-digit accuracy. It permits login, password, privilege, and can be used on a local area network. Simplex has full communications and a remote or local printer spooler. Above all, Simplex is modular and grows with you! Simplex also has a full-featured, English-like language which is simple to use.



You can't buy Simplex™, but it is now available as an integral part of
it's my **Business**™ and will be used by it's my **Word**™, it's my **Graphics**™, . . .

Businessmen! *it's my Business* will revolutionize the way that you handle your business. It saves time, money, and standardizes your system for all who use it. *it's my Business* comes with applications like accounting, interoffice or intraoffice mail, editing, invoicing, inventory management, mail list, calendar, scheduler, forms and more. You can modify each of these to create applications specifically designed for you... maybe we should have called it "it's your Business".

Professionals! *it's my Business* has over 200 pages of examples and demonstrations to show you how to solve your everyday professional problems. And if these examples aren't enough, we give you a complimentary one-year subscription to Questalk™, our hands-on Simplex applications magazine.

System integrators and consultants, beware! If you are not using *it's my Business* with Simplex to solve your problems, don't be surprised when more novice programmers solve that complex math, industrial engineering, or business problem faster. We think that you can cut your concept-to-development time by an order of magnitude!

it's my Business (includes *it's my Editor*) - \$695.00
it's my Business Demo Disk - \$20.00
it's my Editor - \$100.00.

Quest Research software is available through your local computer store or through mail order from Quest Software Corporation at (205) 539-8086. 303 Williams Avenue, Huntsville, AL 35801.

Value added resellers and dealers please contact Quest Research, Incorporated at (800) 558-8088. 303 Williams Avenue, Huntsville, AL, 35801.

Quest™
Quest Research Inc.

IBM is a registered trademark of International Business Machines. Macintosh is a trademark of Apple Corporation. *it's my Business*, *it's my Word*, *it's my Graphics*, *it's my Editor*, *it's my Home*, *it's my Voice*, *it's my Ear*, *it's my Statistics*, Simplex, MouSim, Questalk, and the Quest logo are trademarks of Quest Research, Incorporated.



IRMA[™] has just made
PC-to-mainframe
communications a
touch faster.



Until now, when you operated the PC in the terminal emulation mode, keys had to be redefined.

For inexperienced users, that could be both awkward and time-consuming.

What's more, it's always required quite a few keystrokes to engage a PC-to-mainframe function such as file transferring.

The result again was an increase in the chance for human error.

As well as an increase in the amount of time and money spent on a job.

Now IRMA's addressed both those problems with a keyboard that costs only \$329, suggested retail.

Introducing the IRMAkey/3270. IRMAkey contains all the 3270 keys

for terminal emulation. And all the PC keys when you're in the computer processing mode.

Moreover, IRMAkey contains four additional keys that allow the PC user to get IRMA up and running immediately as well as engage any DCA software system the user wants.

All in one simple stroke. IRMAkey/3270. Only from DCA. It's a touch faster than a terminal. Or a PC. Or both.

For more information, send in the coupon to DCA. Faster still, call us at 1-800-241-IRMA. Telex 261375 DCAATL.

*Mail to DCA, 303 Technology Park, Norcross, GA 30092.
And we'll tell you more about all IRMA products.*

Name

Firm Title

Address

City State Zip

Phone



Digital Communications Associates, Inc.

MP-02-09

IRMA and IRMAkey/3270 are trademarks of Digital Communications Associates, Inc. DCA is a registered trademark of Digital Communications Associates, Inc. © 1984, Digital Communications Associates, Inc.

SEEQUA SHOWS YOU HOW TO GET AN IBM PC FOR JUST \$1595.

BUY A CHAMELEON BY SEEQUA.



The Chameleon by Seequa does everything an IBM PC does. For about \$1000 less than an IBM.

The Chameleon lets you run popular IBM software like Lotus® 1-2-3™ and dBase II.® It has a full 83 key keyboard just like an IBM. A disk drive like the IBM. And a bright 80 × 25 character screen just like an IBM.

But it's not just the Chameleon's similarities to the IBM that should interest you. Its advantages should, too. The Chameleon also has

an 8 bit micro-processor that lets you run any of the thousands of CP/M-80® programs available. It comes complete with two of the best programs around, Perfect Writer™ and Perfect Calc.™ It's portable. And you can plug it in and start computing the moment you unwrap it.

So if you've been interested in an IBM personal computer, now you know where you can get one for \$1595. Wherever they sell Chameleons.

The Chameleon by
SEEQUA
COMPUTER
CORPORATION
8305 Telegraph Road
Odenton, MD 21113

Chameleon shown with optional second disk drive.

To learn more about Seequa or for the location of the Seequa dealer nearest you, call (800) 638-6066 or (301) 672-3600.

IBM is a registered trademark of International Business Machines Corporation.

IBM News

FROM THE EDITORS OF PC

OCTOBER 30, 1984

IBM Floods Market With Low-Cost Software

Low prices, on-disk documentation, dozens of titles shake market—and more is coming!

BY JAMES LANGDELL

BOCA RATON—In a move that has stunned both program developers and computer retailers, IBM has plunged full force into the PC software market. The first round of entries in its new "Personally Developed Software" series contains 36 packages priced as low as \$14.95, and covering a wide range of topics, from games to education to utilities to serious

business applications. And IBM has announced that it plans to introduce a minimum of three bundles of this magnitude each year.

Family Affair

This new software line is devoted to programs created by IBM employees or members of their families—a signal that IBM is ready to change the face

of the PC software market. Until now, most personal computer applications programs with the IBM logo were licensed from third-party publishers; few had been originated by IBM. By introducing a series of employee-created programs and offering more internally developed software, such as the recently announced *TopView* environment, IBM is announcing that it is

ready to enter all levels of the market with software that is "now invented here."

Most of IBM's initial programs offer significant value at low prices that are unprecedented for IBM. With this line, IBM moves into niches staked out by smaller software publishers and brings the software for the PC and PCjr close to the (continued)

Data General Portable Sports Desktop Features

The DG/One takes a strong stance and aims at Compaq's and Kaypro's markets

BY BILL MACHRONE AND CHARLES BERMANT

NEW YORK—Data General's portable computer is a many-faceted machine designed to incorporate the best qualities of existing desktop and portable units.

The Westboro, Mass. based company acknowledges that the new machine will be immediately compared to Hewlett-Packard's HP 110, but Data General/One, as it is called, is being



positioned to steal Compaq Computer's and Kaypro's share of the market.

"It's a PC, not a portable," says DG spokesperson Michael Klatman of the new One, which is both highly MS-DOS and CP/M compatible. While the machine occupies the better part of an average attache case, it is the first complete, fully functional PC-workalike of its size.

The DG/One weighs from 9 to 12 pounds, depending upon the options you select, and looks more like an upper-end, personal electronic typewriter than a full-strength computer. Perhaps its boldest stroke is the screen, a 12-inch diagonal measurement, 25-by-80 liquid crystal display (LCD) screen that flips up from the closed unit. The DG/One's screen is the first commercial offering of a 25-by-80 LCD. The abbreviated size of their screens has been a limitation to the growth and utility of other machines in this class.

Screen Gem

The screen, though it lacks the resolution and brightness of a CRT, is the same size as that of most PCs. It represents a leap (continued)

IBM's Personally Developed Software

TITLES	PRICE	COMMENTS
● ENTERTAINMENT FAMILY (All require color monitor except where indicated)		
1 Backgammon	\$ 19.95	
2 Blackjack	19.95	
3 Crypto-Mania	19.95	
4 Kaleidoscope	14.95	
5 Roadrunner Rescue	19.95	
6 3-K Trivia	19.95	
7 Word Seeking	19.95	Will run on monochrome monitor
8 Zuran	19.95	
● EDUCATION FAMILY (All require color monitor except where indicated)		
9 Adventures with Decimals	\$ 24.95	
10 Adventures with Fractions	24.95	
11 Adventures with Negative Numbers	24.95	
12 Adventures with Decimals, Fractions, and Negative Numbers	44.95	Combines programs 9, 10, 11
13 Algebra Tutor	29.95	Requires IBM Private Tutor
14 Beyond basic BASIC	19.95	Requires IBM Private Tutor
15 Matrix Madness	19.95	
16 Morse Code Drills	14.95	Will run on monochrome monitor
17 These United States	19.95	
● PRODUCTIVITY FAMILY		
18 DOS File Tracker	\$ 19.95	
19 File Facility	19.95	
20 PC Palette	39.95	
21 Personal Computer Picture Graphics	29.95	
22 Phone Directory On-Line	24.95	
23 Print Buffer On-Line	19.95	
24 Phone Directory and Print Buffer On-Line	34.95	Combines programs 22 and 23
25 SciCalc	24.95	
26 Select-A-Font	19.95	
27 The StarProof Bridge	14.95	Runs WordStar files in IBM's Word Proof
28 STATLIB 1	149.95	Requires IBM APL
29 STATLIB 2	149.95	Requires IBM APL
30 Utilities I	19.95	File Compress & Expand; DOS Command Retriever
31 Utilities II	19.95	File Locator; Backup & Unmark; DOS Tree Display
● BUSINESS FAMILY		
32 Executive Phone Directory	\$ 34.95	
33 Executive Phone Directory with message feature	39.95	Runs on IBM Cluster
34 Executive Phone Directory build your own	149.95	Can edit lists from other data files
35 Portfolio Management System	99.95	Links to Dow Jones
36 Project Planning and Scheduling	149.95	
● VALUE PACKAGES		
Family Game Package	\$ 59.95	Includes 1, 2, 5, 6, 8
Math Package	49.95	Includes 12, 13
Scientific Package	194.95	Includes 25, 28, 29
Fun-in-Learning Package	68.95	Includes 3, 7, 14, 15, 16, 17
Utilities Package	56.95	Includes 18, 19, 27, 30, 31
Creativity Package	62.95	Includes 4, 20, 21, 26
Complete Catalog Promotional Package	865.95	Includes all 36 programs

IBM Software (continued)

price level of programs for home machines such as the Commodore 64.

Software by the Carton

The first team of 40 authors achieved few technical breakthroughs in the 36 software packages of IBM's initial release. But the sheer mass and variety of these programs reveals a secret weapon that IBM is finally bringing into the software market—the programming skills of IBM's staff.

Since IBM has more than 10,000 employees in its Entry System Division alone, it has an oceanic talent pool.

All the Personally Developed Software—from backgammon to phone directories to APL statistical routines—was developed by IBM employees and their families. In the first release, for example, two games were created by an IBM staffer's teenage son. IBM's no-frills packaging for the Personally Developed Software series allows it to publish far more of its employees' programs at low prices ranging from \$14.95 to \$149.95.

IBM doesn't permit its employees to develop software for other companies. To compensate, it established a Software Submissions department that arranges for IBM to publish programs created by IBM employees on their own time, and to pay these authors royalties.

When a program requires extensive documentation, IBM will continue to package it in the familiar rigid, linen-covered box. This past year, whenever a program could be explained in a few pages, IBM has used two other formats: a vinyl folder or thin plastic box (also used for PCjr cartridges) with a booklet enclosed.

Manual-less

The Personally Developed Software format gives IBM the less-expensive option of putting its program disks in generic cardboard folders with no printed manual at all. You must print out all documentation from text files on the program disks, or read the instructions on your screen. However, the

IBM Software (continued)

programs are generally easy to use, and many users will welcome the idea of software sold without any printed documentation whatsoever.

The Personally Developed Software will be available at some IBM Product Centers and from IBM's authorized dealers. But IBM has struck a major blow against its normal distribution channels by emphasizing mail and phone orders. A lush catalog describing the 36 programs (along with photographs of the programmers) does a decent selling job. In the future, IBM promises programs in four additional categories: communications, programming, scientific/engineering, and "lifestyle" software.

For further savings, IBM offers six "value packages," each with three to six related programs at a price about one-third less than if the programs were purchased separately. You can also buy all 36 programs for \$865.95; this 40 percent savings is a bargain if you're a modern Renaissance Man who's ready to learn Morse code, play arcade games, do statistical calculations within APL, and maintain four different directories of telephone numbers.

Curious Procedures

IBM worked with the software authors to simplify operations and make them consistent from one program to another. For example, the methods for starting up programs were reduced to three: loading DOS and then entering the letter G, or inserting the disk and then rebooting, or loading the *Private Tutor* training system (\$50 from IBM) and following its on-screen instructions.

There are problems with this approach, however. Rather than printing a few words of start-up instructions on each disk's label, IBM puts on a circled letter—A, B, or C—and expects the user to hunt up a legend on the cardboard jacket to find what that code means.

One advantage of buying IBM's software is that many of the program disks already contain all files required for operation. This spares you the trouble

of transferring portions of IBM's DOS and BASIC onto your disks—a first step that is sometimes more complicated than using the applications program itself.

However, some programs are too closely tailored to an all-IBM system. For example, the *Matrix Madness* educational package has an embedded start-up process that explicitly calls on IBM's BASICA, so the program can't be run on a compatible computer that uses Microsoft's equivalent GWBASIC.

Each package presents a menu that allows you to read the documentation on screen or to print it out, in full or for particular topics. Beyond the IBM-standardized table of contents, the quality and style of these on-disk manuals varies according to the author's abilities and whims. In *Kaleidoscope*, for example, IBM let stand the programmer's conceit of using this spelling: "symmettrriies."

In some manuals, the authors use symbols that spruce up the text's appearance on screen; with certain printers, however, these symbols cause unpredictable results. For example, whenever a degree sign (°) appeared as a bullet to set off a topic, an Okidata printer reacted by inserting some carriage returns.

Some on-screen decorative borders rendered on strings of numbers when rendered on an IBM/Epson printer without Grafrax. IBM should have edited its on-disk manuals with a greater concern for their hard-copy appearances.

Some Bundle

In spite of these problems, the first set of Personally Developed Software offers many worthwhile programs at bargain prices that are unprecedented—at least from IBM. More details about these 36 programs are published in IBM's first issue of *The Directory*, which is available free by writing to Personally Developed Software, P.O. Box 3280, Wallingford, CT 06494. A subscription to a year's three issues nominally costs \$10, but you can obtain them free by sending IBM a questionnaire bound into the first issue. ■

Data General/One (continued)

forward in LCD quality and manufacturing ability but is dependent on ambient light for proper viewing.

Klatman says that you should be at a 45 degree angle to the screen to see it clearly. Observers outside the viewing angle will see a distorted image or nothing at all.

The narrow keyboard saves

goes on to predict that the smaller disk system will soon become the industry standard.

One reason that the 3½-inch drives were so attractive to DG is their low power consumption. The machine is powered from a Nicad battery pack, designed to last about 7 hours when the disks are accessed 20 percent of the time. One observer quipped, "Just as long as it gets



The DG/One, and peripherals, go for Compaq, Kaypro market

space by placing function and cursor control keys close to the typewriter keys. The auxiliary keys are colored in contrasting shades to help in locating them. The numeric keypad is integrated into the alphabetic keys, as with the Radio Shack Model 100 and generations of IBM key-punch machines. The keys have a distinctive, over-the-center click and a short, crisp travel.

A CMOS 80C88 chip running at 4 MHz does the processing chores. Although a standard PC runs about 15 percent faster, the difference is not noticeable in most operations. Performance is not likely to be a factor to most users, since they will select the machine for its full-featured portability rather than speed.

Power Supply

DG/One stores its data on two internal 3½-inch double-sided Sony disk drives, good for 760K each. Again, this configuration is a first for a product in this class. The machine can also be configured to recognize an outboard 5¼-inch floppy disk assembly as the A: drive. Klatman claims that the DG/One can run any IBM-compatible program in this manner and

me from one coast to another." Klatman replied that the transcontinental business trip was one of the battery-life design criteria.

The system recharges in a matter of hours, or you can slip in a fresh battery pack. An AC adapter supplies the power when the machine is on the desktop.

Other options include a 300-baud internal modem and up to 512K of memory. A 1200-baud modem can be plugged into one of two serial ports hidden behind a cleverly hinged plastic back panel. Company-manufactured peripherals expected in the near future include a small printer and an external hard disk. Curiously, there is no parallel port, a departure from the IBM norm.

The machine was developed and is manufactured by DG's Japanese subsidiary, Nippon Data General, which Klatman says acquired technology unavailable to DG as an American company. While Klatman declines to release the initial production figures, he says that 20,000 square feet have been added to specifically accommodate the machine's manufacture. ■

Mr. Chips™ Plays Your PC Like a One Man Band



Mr. Chips, the new multi-function card from Orange Micro, adds a full ensemble of features to your IBM® PC. Memory, printer ports, and a clock are standard, and you'd expect them on a top quality board. But computing is changing.

Soon computers will take care of everyday things; like watering the lawn, or turning on your lights when it gets dark. And only Mr. Chips can do this now. These capabilities are standard, so your growing needs won't require additional equipment. There's also a dual game port, so you can duel to the end, by yourself or with a friend.

Every Mr. Chips comes with Chipdisk™ software, for RAM disk and print spooling. With RAM disk you set up your PC's memory to act like a disk drive. This means much faster execution and searching of programs. Print spooling sets your PC's RAM to serve as a printer buffer, so you can compute even while your printer is printing.

You can orchestrate all this power



for a remarkably low price. Visit your dealer and see for yourself: Mr. Chips is the multi-function card for today...and tomorrow.

The First Multi-function Card with 9 Standard Features

- **Parallel Port***: Great for getting fast printouts on efficient dot matrix printers.
- **Serial Port**: The most popular way to access high grade letter quality printers or phone modem communications.
- **64K-256K RAM**: Upgrade your PC's memory to handle powerful integrated software and other larger programs.
- **Clock/Calendar**: Accurately keep track of time and date, even when your computer is turned off.
- **Dual Game Port***: Accommodate two complete joysticks at once, so you can play alone or duel with a friend. Also for use with CAD/CAM software.
- **Real World Interface**: This innovative port can monitor and control equipment like thermostats, moisture detectors, photocells and other independent devices.

- **BSR™ AC Line Controller***: Control your lights, appliances, security systems, or anything that plugs into an AC wall socket.
- **Chipdisk RAM Disk**: Set your PC memory to act like a disk drive. Your programs will run much faster than with conventional disk drives.
- **Chipdisk Print Spooler**: Your PC memory will serve as a printer buffer, so you won't have to wait for your printer anymore.

*Cables available separately



**Orange Micro
Inc.**

1400 N. LAKEVIEW AVE., ANAHEIM, CA 92807 USA
(714) 779-2772 TELEX: 183511CSMA

■ BSR is a registered trademark of the BSR Corporation
■ IBM is a registered trademark of International Business Machines Corporation

© Orange Micro, Inc., 1984

This is THE PASCAL COMPILER You've Been Hearing About



"It's almost certainly better
than IBM's Pascal for the PC...
Recommended."

Jerry Pournelle
Byte, May 1984

\$49.95

"If you don't have CP/M [for
your Apple], Turbo Pascal is
reason enough to buy it."

Cary Hara
Softalk Apple, May 1984

VERSION 2.0

"If you have the slightest interest in Pascal... buy it."
Bruce Webster, Softalk IBM, March, 1984

And Now It's Even Better Than You've Heard!

- Windowing (IBM PC, XT, jr. or true compatibles)
- Color, Sound and Graphics Support (IBM PC, XT, jr. or true compatibles)
- Optional 8087 Support (*available at an additional charge*)
- Automatic Overlays
- A Full-Screen Editor that's even better than ever
- Full Heap Management—via dispose procedure
- Full Support of Operating System Facilities
- No license fees. You can sell the programs you write with Turbo Pascal without extra cost.

Yes. We still include Microcalc... the sample spreadsheet written with Turbo Pascal. You can study the source code to learn how a spreadsheet is written... it's right on the disk.* And, if you're running Turbo Pascal with the 8087 option, you'll never have seen a spreadsheet calculate this fast before!

*Except Commodore 64 CP/M.

Order Your Copy of TURBO PASCAL® VERSION 2.0 Today

For VISA and MasterCard orders call toll free:
In California:

1-800-255-8008
1-800-742-1133

(lines open 24 hrs, 7 days a week)

Dealer & Distributor Inquiries Welcome 408-438-8400

Choose One (please add \$5.00 for shipping and handling for U.S. orders. Shipped UPS)

- _____ Turbo Pascal 2.0 \$49.95 + \$5.00
- _____ Turbo Pascal with 8087 support \$89.95 + \$5.00
- _____ Update (1.0 to 2.0) Must be accompanied by the original master \$29.95 + \$5.00
- _____ Update (1.0 to 8087) Must be accompanied by the original master \$69.95 + \$5.00

Check _____ Money Order _____
VISA _____ MasterCard _____
Card #: _____
Exp. date: _____



Borland International
4113 Scotts Valley Drive
Scotts Valley, California 95066
TELEX: 172373

My system is: 8 bit _____ 16 bit _____
Operating System: CP/M 80 _____
CP/M 86 _____ MS DOS _____ PC DOS _____

Computer: _____
Disk Format: _____

Please be sure model number & format are correct

Name: _____
Address: _____
City/State/Zip: _____
Telephone: _____

California residents add 6% sales tax. Outside U.S.A. add \$15.00 (if outside of U.S.A. payment must be by bank draft payable in the U.S. and in U.S. dollars.) Sorry, no C.O.D. or Purchase Orders

THE RACE FOR SPACE

Maynard's in the lead with an expanding universe of space-saving systems for your PC!

Modular disk drive systems by Maynard Electronics drive technology to the limit to deliver unmatched performance with PC-DOS compatibility including self-booting off the hard disk.

10MB Winchester Internal Hard Disk Drive System!



This dynamic system lets you upgrade your PC or compatible to XT effectiveness, is internally installed, and does not require an additional power supply! The 10MB Hard Disk Drive System is equipped with the SandStar™ Hard Disk Controller Card which can accept up to three additional modular functions. Or, configure your system with the Hard Disk Controller Module and the SandStar Floppy Drive Controller Card which runs 5 1/4" and 8" Floppy Drives while still leaving four expansion slots for additional boards! Or, if you prefer, arrange your system with the Hard Disk Controller Module and the SandStar™ Memory Card which lets you add from 64K to 576K of memory using only one card slot!

Maynard's SandStar™ Cards and Modules can put you lightyears ahead...

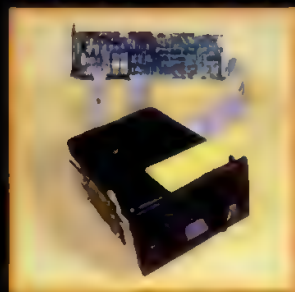
With technology racing into the future, serious computer users need to set their sights beyond obsolescence. Through the use of versatile SandStar™ Cards and Modules, Maynard has been able to engineer hardware to keep pace with tomorrow's needs. With Maynard's Disk Drive Systems and SandStar™ Cards and Modules, you won't be left behind in the race for space. For more details, call your dealer or distributor today.

NEW! "The Apollo" 30MB Internal Hard Disk Drive.

This powerhouse comes with 30MB of on-line storage using PC DOS without any special software drivers. Discover new worlds of data efficiency and versatility. Our 30MB system includes the Hard Disk Controller Card or any of the other SandStar™ Cards with Hard Disk Controller Module.



NEW! "The Gemini" Hard and Floppy Drive System.



Now, for the first time, add the Gemini to your one drive system and take full advantage of internal Hard Disk power along with two internal Floppy Drive units. The Gemini comes with a sleek 10MB Half-Height Hard Disk Drive, a Half-Height Floppy Disk Drive (DS/DD), and the

SandStar™ Floppy Drive Controller Card with the Hard Disk Controller Module. Boost memory capacity dramatically while using no more space than a standard floppy drive! The Gemini can also be configured with either the SandStar™ Hard Disk Controller Card or the SandStar™ Memory Card with the Hard Disk Controller Module.



MAYNARD ELECTRONICS

450 E. Semoran Blvd.
Casselberry, Florida 32707
305/331-6402

Circle 437 ON READER SERVICE CARD

We make modern times better.

Serial Port, Parallel Port, Hard Disk Controller, Clock Generator, Game Adapter, and Prototyping Modules are available.

PRODUCT REVIEW

A Look into IBM's Box Of Homegrown Software

NEW YORK—Since boxes of IBM's Personally Developed Software were dumped on our desks, the PC News staff has spent tireless hours on the somewhat overwhelming task of evaluating the new programs. Admittedly, it hasn't all been hard work.

What follows is the first wave of observations. Further reviews of entertainment, education, productivity, and business programs will be upcoming in PC News.

To order by mail, write to: Personally Developed Software, P.O. Box 3280, Wallingford, CT 06494. For phone orders call 1-800-426-7279, Monday through Friday, 8 a.m. to 8 p.m.

Word Seeking

by Jim Cyr, Ronald C. Thomas
List Price: \$19.95

Requires: 128K, DOS 1.1 or later, one disk drive (printer is recommended).

Up, down, sideways, or diagonal, anyway you look at it, *Word Seeking* is a time saving way to create your own word search puzzles.

You create new puzzles by entering 20 words that the program jumbles into a 20-line word search puzzle. You solve the puzzle on-screen by moving the cursor to highlight the letters that diagonally, horizontally, or vertically comprise the word you are looking for. Besides solving the puzzle on-screen, you can highlight the solution to hard-to-find words, or choose to print out versions of the puzzle with words, without words, or with the answers fully displayed.

"Customized" options are available so that you can have a musical note play each time a letter is chosen as part of the solution, increase or decrease the puzzle size by from one to two letters, alphabetize the list of words to be found in the puzzle, and even reuse old words in a different puzzle configuration.

Although games like *Word Seeking* seem to promote premature blindness from scanning rows of jumbled letters, they also sharpen your ability to find needles in haystacks. It would make an interesting pastime for

a long car ride if parents pre-printed a batch of *Word Seeking* puzzles for the kids.

—Virginia Dudek

3-K Trivia

by Keith Frechette

List Price: \$19.95

Requires: 64K, color display, one disk drive.

3-K Trivia accomplishes the rare feat of being simultaneously ingenious, addicting, and trendy. It takes its cue from the Yuppie parlor game, *Trivial Pursuit*, filtering it through the short attention span of the computer generation.

Categories are determined through a random spin of slot machine graphics, like "The Joker is Wild" questions increase in value when there are two of a kind (category) or a

joker present. The game has 3,000 questions that rarely repeat, and the player is given the words and spaces of the correct answer. With the timing feature, it more resembles a fast-paced game show than its stodgy, tony predecessor.

3-K Trivia borrows several questions from *Trivial Pursuit*, but the computer version allows you to add your own questions; none of the 15 questions I added surfaced during 2 hours of additional play.

The game succeeds because it combines equal parts of skill and chance. A person answering an easy "bonus" question can beat an opponent who fielded eight difficult queries. The rules of such games hold true: Your opponent always gets the easiest questions and the computer seems to know to ask about subjects on which you have a mental block.

There are, alas, some mistakes: Rhoda's sister was portrayed by Julie Kavner, not "Kazner," as the game insists, and the Bee Gees originally hail from Manchester, England, not Australia. But these criticisms are, well, trivial.

—Charles Bermant

Blackjack

by Wayne Hammond

List Price: \$19.95

Requires: 128K, DOS 1.1 or later, color display, one disk drive.

Blackjack can handle several players, yet it would be hard to imagine eight people huddled around a computer screen, passing around a keyboard to place their bets. It's fast and lively (especially on the AT), but the sound effects are simplistic and annoying.

The colors, also, are downright nauseating. You can change the cards' hue, but can't tone down the bright green background. Perhaps the gaudiness is meant to reproduce the tackiness of a real casino, complete with real headaches: the clashing colors could cause the program to be sold as a cheap, reusable hallucinogen.

But it's not boring and will be welcomed by anyone who has been hooked by blackjack on the Source. Still, my advice is to play this game alone and with a monochrome monitor.

—Charles Bermant

These United States

by Art Thompson

List Price: \$19.95

Requires: 128K, DOS 1.1 or later, color display, one disk drive.

Some programs can be enjoyed by adults and children alike, but *These United States* is decidedly not one of them. It quizzes players about capitals, largest metropolitan areas and the year a state entered the Union.

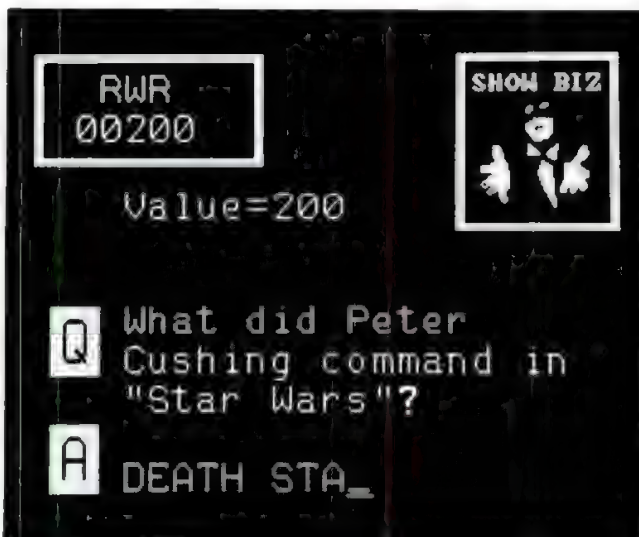
But, if you type "SAnTa Fe" instead of "Santa Fe," the game registers a wrong answer—definitely not an example of democracy at work. It would be more worthwhile if it contained mutable information, such as governors and congressmen, or a way to add such facts. As it stands, *These United States* is too cut and dried; an atlas is a far better investment.

—Charles Bermant

Crypto-Mania

by Russell P. Holsclaw, Frank D. Dennison, Carl M. Dennison

(continued)



COHERENT™ IS SUPERIOR TO UNIX* AND IT'S AVAILABLE TODAY ON THE IBM PC.

Mark Williams Company hasn't just taken a mini-computer operating system, like UNIX, and ported it to the PC. We wrote COHERENT ourselves. We were able to bring UNIX capability to the PC with the PC in mind, making it the most efficient personal computer work station available at an unbelievable price.

For the first time you get a multi-user, multitasking operating system on your IBM PC. Because COHERENT is UNIX-compatible, UNIX software will run on the PC under COHERENT.

The software system includes a C-compiler and over 100 utilities, all for \$500. Similar environments cost thousands more.

COHERENT on the IBM PC requires a hard disk and 256K memory. It's available on the IBM XT, and Tecmar, Davong and Corvus hard disks.

Available now. For additional information, call or write,

Mark Williams Company
1430 West Wrightwood, Chicago, Illinois 60614
312/472-6659



COHERENT is a trademark of Mark Williams Company.
*UNIX is a trademark of Bell Laboratories.

CIRCLE 391 ON READER SERVICE CARD

Software Look (continued)**List Price:** \$19.95**Requires:** 128K, DOS 1.1 or later, color display, one double-sided disk drive (printer is recommended).

If you have a deep-seated craving to solve cryptograms, IBM's new *Crypto-Mania* will give you a good workout.

Crypto-Mania lets you set up your own messages, quotes, or fact statements and automatically encodes them by substituting code letters for the correct ones. These can be

stored on disk for later use. The program keeps a record of the average length of time needed to solve each puzzle and also provides a clock while the puzzle is being solved.

For the novice or the dumbfounded, *Crypto-Mania*, if requested, gives hints on how to solve the puzzle. A series of cryptograms is on file covering quotes, dates from history, hidden cryptograms that do not show any of the cryptogram letters, facts from United States history, and notes on solving cryptograms. You can solve 40-

column cryptograms or take on a bigger challenge with 80-column cryptograms. All in all, *Crypto-Mania* seems an entertaining game for those able to tackle quotes from Carlyle to Jefferson and ready to create a few of their own.

—Virginia Dudek

**Adventures With Decimals
Adventures With Fractions
Adventures With Negative Numbers**

by Scott Harris

List Price: \$24.95 each

**Adventures With Decimals,
Fractions, and Negative Numbers**

List Price: \$44.95**Requires:** 128K, color display.

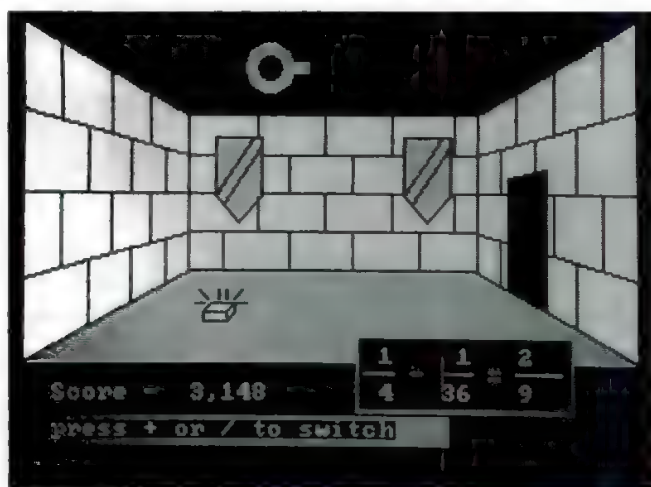
Each of these math adventure programs has a balanced blend of game scenario with a well-graded series of math problems. The screen shows the rooms and corridors of a castle from which you are trying to escape. You can move freely through parts of the castle by pressing cursor keys. To make any real progress, however, by opening doors, collecting treasure, and gathering pieces of a key you need to exit, you must ask to

solve math problems on a specific topic, such as multiplication and division of negative numbers.

The math problems become more difficult as the game goes on, but exiting the castle seemed a more difficult puzzle than the thickest equations. The solution seemed impossible until I tried to walk into a wall and found a secret passageway. Drawing a map of the castle's rooms, doors, and furnishings helped, but this exercise uncovered a bug in the program's graphics: when I stepped out of one room and immediately reentered it, the wall with two banners and the wall with a door were displayed in a mirrored—not rotated—relationship.

The more expensive package lets a player choose math problems on all three topics. It's the best buy since the castle game should be entertaining enough to keep a student playing many times. Unfortunately, the programs are closely tied to IBM's BASIC, which is provided on the disks (a PCjr must have Cartridge BASIC), so they might not run on most compatible computers.

—James Langdell



IBM's New Soft Touch: High Quality, Low Price

New package of aggressively priced programs takes industry by surprise

BY CHARLES BERMANT

BOCA RATON, Fla.—IBM's catalog of bargain-basement programs may very well revolutionize the way software is written and sold. In the process, it could also change the PC's image, making what was once exclusively a work station into a part-time play station.

While some business applications are included in the initial release, the majority of these 36 packages will coax along the PC's slow journey from the office to the rec room. This new generation of homegrown entertainment, education, and personal productivity programs

from IBM is raising lots of eyebrows by offering high quality at a very low price.

Some observers expressed surprise that it took so long for these programs to reach the market, saying that it may be part of a huge development effort by IBM to begin publishing its own applications software.

"For IBM, this is an innovative way to sell some useful programs," says PC software developer Peter Norton. "This is not a particularly aggressive move on its part, just an intelligent way to peddle software

that's worthwhile." Norton also thinks this will encourage more outsiders to submit PC programs to IBM.

But, no matter how successful these new programs are, Big Blue won't match its hardware dominance in the software field.

"IBM is well aware of what it's doing," says Esther Dyson, head of EDventure Holdings in New York. "So far, it hasn't been able to make an impact on the software market, which is a lot more fragmented than the hardware market. There is more to do with software; there is more variety. It won't be dominated by any one publisher."

Small software and games manufacturers have taken notice, but, as Richard Stafford, Technical Director of TCS Software, in Houston, says, "Just because IBM is putting out a lot of inexpensive game programs, it shouldn't mean that anyone else can't compete."

Not only is interest in specific games short-lived, says Stafford, but "the PC market is not the major market for game software—that's more for the Commodore and the Apple. People want to do entertaining things with their PC, but it's not their major motivation."

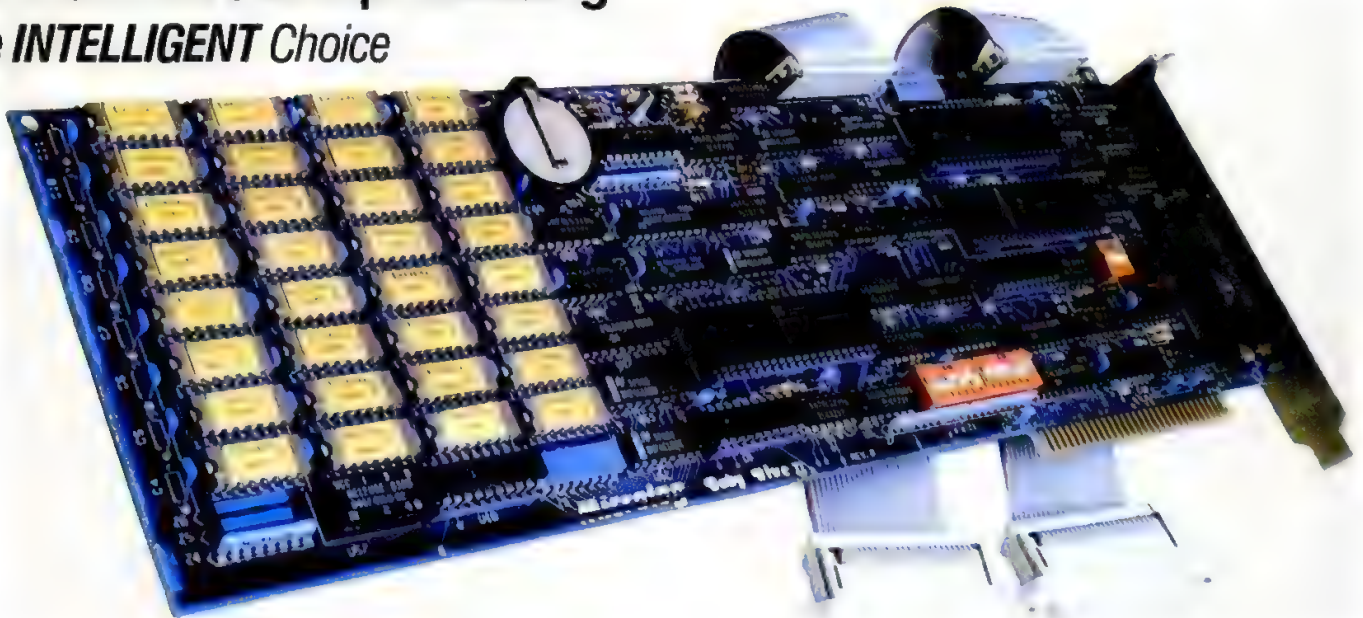
Cathy Carlston of Broderbund Software, of San Rafael, California, agrees, saying they "haven't been terribly aggressive" in going after the PC or the PCjr market.

This bold software stroke has taken the industry by surprise, and most of those contacted by PC News were neither willing nor able to offer a reaction. While it is not expected to drive any successful small companies out of business, it proves that Big Blue now recognizes two salient points: Useful programs need not be expensive, and a PC can be a source of entertainment. **Research coordinator:** Virginia Dudek

BabyBlue II

Multifunction/Multiprocessing

The *INTELLIGENT* Choice



Packed with ALL the popular features:

- Up to a 256 KiloByte Memory Expansion, optional in 64K blocks.
- **Clock/Calendar** with long-life battery back-up (choose replaceable or optional rechargeable battery).
- **Parallel Port** for use with IBM/Epson and most other parallel printers (addressable as LPT1: or LPT2:)
- **Two (2) Serial Ports** addressable as COM1: and COM2:, OR use our unique extended port addressing to configure for serial devices other than COM1: and COM2: (i.e. pointing devices, graphics tablets, etc.)
- **Baby Blue II** is fully compatible with the IBM PC, the PC/XT and other compatibles, including the Texas Instruments Professional Computer.

Not just another DUMB multi-function board.

With all that hardware to manage, we think a board should have a brain. You won't find this feature on other boards—they may look pretty, but they can be pretty boring once you get them home. Baby Blue II is actually a second computer inside your PC, built around the high-speed Z-80B microprocessor.

• Background Processing:

Compile, assemble, sort, calculate, communicate or print—all in the background, while you and your PC continue to work on other tasks in the foreground. Because it is a separate computer, Baby Blue II performs these functions without slowing down your PC, helping you to do more work in less time.

• Autostart at Preset Time:

Baby Blue II can begin any task, even a background operation, at a specific time by consulting the on-board real-time clock.

• CP/M Capability:

Baby Blue II offers instant access to the vast CP/M-80 library of mature, professional software for every conceivable application.

• Dual Ported Memory and I/O:

You can use Baby Blue II's memory, ports and clock as ordinary enhancements to your PC. Or, you can let our Z-80 micro-processor control the board directly, for truly independent back-ground operation.

All this and SOFTWARE too . . .

Systems utilities

PDQ RAMdisk Software: create a FAST pseudo-disk drive of any size in available system RAM. The DOS 2.0 version lets you change the size of your RAMdisk from the keyboard.

Print Buffer/Spooler: a TRUE print spooler: the Z-80 buffers and manages printing independent of your PC. Unlike other so-called "spoolers", this one won't stop your printer or slow you down when you start another job.

Clock Software: sets Baby Blue II's clock and initializes the system clock at boot time—never type the time and date again!

Communications

Smart Terminal Emulator Package (STEP): talk to other microcomputers or connect to larger host computers, as an asynchronous terminal through Baby Blue II's serial ports. Unlike other "smart terminal" programs, STEP offers full emulation of popular video display terminals (the standard package includes Televideo 950 and Hazeltine 1500.

IBM 3101, DEC VT100 and many others are optionally available). You can send or receive text files, and with STEP's unique Sessions Menu, changing your configuration is a keystroke away.

BSTAM File Transfer Utility: Transmit and Receive text, HEX, and binary files (including .COM files) without errors and without fuss. BSTAM is easy to use, with all configuration parameters handled transparently under STEP.

CP/M-80 compatibility

Baby Blue Conversion Software: Microlog's famous CP/M Emulator turns CP/M-80 programs into PC-DOS programs for fast, efficient execution on Baby Blue II. Completely transparent operation using standard PC-DOS commands—freely mix PC-DOS with CP/M programs and text/data files on the same PC-DOS disks.

Convert: supports bidirectional file transfer between PC-DOS and popular CP/M disk formats.

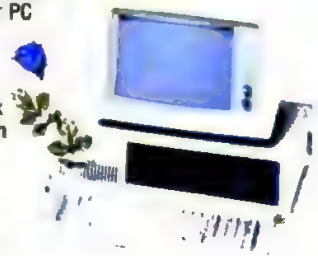
Keyfix: automates your keyboard with 54 programmable function keys for CP/M programs, eliminating tedious typing chores (max. 80 characters per key).

Baby Blue II (64K installed) \$ 695.

QUALITY you can count on . . .

Microlog is in the business of producing high quality, intelligent computer peripherals. Extensive factory testing gives our products one of the highest reliability rates in the industry. The finest components, connectors, and multi-layer PC board design, ensure years of trouble-free operation. We back all our products with a 90 day warranty and full technical support.

For more information on Baby Blue II and other fine Microlog products, see your micro-computer dealer or contact us:



Microlog™
A TI INTERNATIONAL COMPANY

Microlog, Inc.
222 Rte. 59
Suffern, NY 10901
(914) 368-0353

CIRCLE 516 ON READER SERVICE CARD

Baby Blue II is a trademark of Microlog, Inc.
CP/M is a registered trademark of Digital Research, Inc.
BSTAM is a trademark of Byron Software, Inc.
IBM is a trademark of you know who.
©1983 Microlog, Inc.



I fell 20,000 feet and lived.

There I was flying Microsoft® Flight Simulator over Chicago's O'Hare Airport, having the time of my life. Suddenly my carburetor started icing. My RPMs started falling. My altimeter spun backwards. The Sears Tower loomed ahead.

I was behind the controls of a Cessna 182. As an experienced Microsoft pilot, I had taken off and landed at 80 different airports. Created different flying challenges (using my Microsoft Mouse and my joysticks). Altered the weather, time and season. Even flown the World War I dogfight mode and successfully battled enemy aircraft.

Whether you're using an RGB, composite or monochrome monitor, nobody flies the IBM®

PC and PCjr like Microsoft. Because Microsoft's MS-DOS™ operating system tells them how to think. And Microsoft BASIC is the language spoken by nine out of ten microcomputers worldwide.

The next time I flew they had repaired the Sears Tower. My next stop? The World Trade Center.

Sound fun? Then fly Microsoft. Call (800) 426-9400 for the name of your nearest Microsoft dealer. In Washington State, Alaska, Hawaii and Canada (206) 828-8088.

MICROSOFT®
The High Performance Software

Now IRMA™
can make any
printer work
with your
3270 network.
Well, almost.





When you set up an IBM® 3270 network, you're faced with the fact that you can't just go out and buy any printer to work with it.

Your choices are, to say the least, limited. Even IBM only makes a few that are compatible.

But with new IRMAprint from DCA, the limits are off.

IRMAprint isn't a printer. It's a printer emulator. In technical terms, it hoodwinks the IBM mainframe into thinking that whatever printer attached to it is a 3287.

So now if there's a more economical printer you want to use, use it. If you'd like to plug in a laser printer, plug it in. If you've always wanted to upgrade to a printer with better capabilities, there's never been a better time than now.

You would think that, with all that it does, installing an IRMAprint might prove to be a headache.

It's not.

IRMAprint is installed right at the controller site with a simple standard coaxial cable. And two models of IRMAprint are available for either an RS-232C or Centronics® Parallel Interface.

IRMAprint. It's new from DCA, the makers of the IRMA family of IBM-emulation products.

It lets you choose any printer that's right for the job, instead of the few that are right for the network.

For more information about IRMAprint, or any of the IRMA family of IBM-emulation products, send in the coupon below. Faster still, call 1-800-241-IRMA. Telex 261375 DCAATL.

Mail to 303 Technology Park, Norcross, GA 30092. And we'll tell you more about IRMAprint and all IRMA products.

Name

Firm Title

Address

City State Zip

Phone



MP-02-08

IRMA and IRMAprint are trademarks of Digital Communications Associates, Inc. DCA is a registered trademark of Digital Communications Associates, Inc. Centronics is a registered trademark of Centronics Data Computer Corp. IBM is a registered trademark of International Business Machines Corporation. © 1984 Digital Communications Associates, Inc.

A NOTED AUTHORITY SPEAKS OUT ON DATABASE MANAGEMENT.

"I've got 4 billion customers.
"The world's biggest
database.

"So I need all the power I
can get my hands on.

"That's why I use R:base."

"With R:base, I can access
billions of records. Open 40
files at the same time. Handle
up to 400 fields. And sort it
all out in a hurry. It's everything
I need to keep my lists in order.

"And if your inventory is
anything like mine, you'll
appreciate the programming
capability of R:base. It lets me
do conditional processing.
Post transactions. And update
multiple files from one input
form.

"But even with all that
power, the real gift is that it's
so easy to use.

"For starters, its on-screen
tutorial makes R:base a snap
to learn. And now, there's a new
applications diskette with
ready-to-use mailing list, inven-
tory management, and fore-
casting applications.

"Not only that, R:base is
designed to work with Clout."
That's the program that lets
me—and my elves—talk to
our personal computers in
plain English. Clout also
remembers where my
data is stored, and can
search for it across

all files. So I don't have to!

"And here's the best
package of all.

"For only \$14.95 (plus ship-
ping), Microrim will send you
a demo/tutorial packet of both
R:base and Clout. Just call
1-800-547-4000, Dept. 862.
In Oregon, call 1-503-684-3000.
Or see your nearest software
store now.

"Because if your workload
starts to snowball, you could
end up out in the cold!"



R:BASE™

FROM MICRORIM®

Requires 256K of memory. Runs on MS-DOS and PC DOS
operating systems. CP/M-80 requires 64K.

CIRCLE 428 ON READER SERVICE CARD



DUNSPLUS: THE MICRO SOLUTION THAT REFLECTS THE WAY YOU DO BUSINESS



You've heard the buzzwords: user friendly, integrated, smarter, faster, cheaper. But when you push the rhetoric aside you're still asking the same question, "Why can't I get a system that solves more problems than it creates?"

You can. It's called DunsPlus and it's built to respond to your information-related business demands without creating demands of its own.

DunsPlus gives the IBM PC XT a built-in business environment. This lets you mold DunsPlus to fit the way you do business.

Within the DunsPlus environment is a software base of the best. Lotus, MultiMate, Western Union electronic mail (to name but a few), are all ready for immediate use. But additional programs to solve your unique problems can also be added with ease.

Instant, yet controlled, access to your choice of mainframes and subscription databases is also a part of the DunsPlus environment. And transferring data throughout the system is as easy as moving a piece of paper from the In Box to the Out Box.

Immediate end-user productivity is not an issue: DunsPlus is a menu-driven system requiring minimal keystrokes for maximum results.

Installation is not an issue: DunsPlus is installed by IBM.

End-user training is not an issue: Training and support are part and parcel of DunsPlus.

Flexibility is not an issue: Any part of the DunsPlus solution—hardware, software, or service—can be tailored to meet your precise business needs.

In fact, there are no issues. DunsPlus does what you want, the way you want it—now.

Designing systems that reflect the way you do business is business as usual for us. NOMAD2, the premier 4th-Generation-Language/DBMS from D&B Computing Services, has made us a leader in the field of information management services. And as your needs evolve, so do we. DunsPlus is just the latest step in translating technological advances into usable business tools—tools that reflect the way you do business.

DUNSPLUS: AN INNOVATION IN END-USER COMPUTING FROM DUN & BRADSTREET

DunsPlus

DB a company of
The Dun & Bradstreet Corporation

For further information call: 800-DNB-PLUS. Or drop your business card into an envelope and mail it to DUNSPLUS, 187 Danbury Road, Wilton, CT 06897

Lotus spreadsheet and graphics from Lotus Development Corporation. MultiMate™ word processing from MultiMate International, Inc. IBM is a registered trademark of International Business Machines Corporation. DunsPlus is a registered trademark of DunsPlus, a company of the Dun & Bradstreet Corporation. NOMAD2 is a trademark of D&B Computing Services.

CIRCLE 161 ON READER SERVICE CARD

IS PROJECT MANAGEMENT SUCCESS WORTH \$795?

You bet it is . . . and we guarantee it! PLAN/TRAX 3 is the most complete project management package available and includes complete CPM Network graphics, resource loading and leveling, budget and schedule monitoring and much more. Try PLAN/TRAX 3 at no risk for 30 days. If you are not completely satisfied you will receive a complete refund. To find out more ask your dealer for a demonstration or contact: OMICRON, 57 Executive Park, Suite 590, Atlanta, GA 30329 404/325-0124.

- 700 Activities per project using Gantt or CPM scheduling
- Link project files together
- Calendar for controlling week-ends and holidays
- Resource loading and leveling
- Track activity costs and up to 10 labor resources
- Over 20 user selectable reports
- Complete CPM Network graphics
- All reports can be previewed on-screen.

PLAN/TRAX 3 By Omicron

A unit of Engineering Science, Inc.
and The Ralph M. Parsons Co.
Prices subject to change without notice.



Omicron

OMICRON SYSTEMS CORPORATION

Corona Debuts Multi-user, Multi-terminal Mega PC

'IBM and Corona are attacking the same market from different directions,' says Corona about its eight-workstation system

BY ROBIN WEBSTER

SAN FRANCISCO—At the same time that IBM was unleashing the PC AT and PC network on the world, rival computer maker Corona Data Systems quietly announced its own Mega PC multi-user system.

The Mega PC is an Intel 8088-based machine that uses the MS-DOS operating system and can support up to eight attached workstations. It comes with a standard 256K memory, upgradable to 512K. A two-user system (256K per user) with an internal 10-megabyte disk is priced at \$7,805. Extra workstations cost \$1,495 each, and 20-megabyte and 40-megabyte versions are also available.

However, the Mega PC is not a conventional multi-user computer at all—it is really more of a file-server system.

Instead of having the relatively underpowered 8088 handle all the multi-user activity, Corona equipped the Mega PC with 11 PC-compatible expansion slots. Eight of these slots can be used to support Corona's Application Processor Cards (APCs), which are designed around the much faster 8MHz Intel 8088-2 microprocessor and contain 256K to 512K of RAM and 16K of ROM.

Each multi-user workstation requires an APC board to support it, a scheme Corona chairman Robert Harp describes as "almost like giving users a local area network in one box."

Multi-user Mega

The Mega PC workstations can work either as standalone IBM XT-compatibles, or in multifunction, multitiered mode. The 14-inch green phosphor screens have super 640-by-400 pixel resolution (where



possible) and 256K to 512K of internal RAM. At the product announcement, the APC/workstation combination appeared to be IBM-compatible—it ran software such as *Microsoft Word*, *Flight Simulator*, *DR Draw*, and *MultiMate*.

In addition to the possible eight APC boards, the Mega PC contains the main file-server board, a hard disk controller card, and a spare slot for video or communications boards. (Any unused APC slot can also take an IBM-compatible add-on board.)

Unfortunately, it is not yet clear which IBM-compatible

boards will work with the Mega PC. "There will have to be the necessary device drivers so that add-on boards can be used. The drivers will be developed by Corona, but they will be user-installable," Mike Toft, Corona director of software engineering, told *PC Magazine*.

And, as to why Corona didn't decide to build the Mega PC around a more powerful chip, such as the Intel 80186, Toft added, "We did try to use faster CPUs than the 8088, but we found that the I/O transfer rates were such a constraint that the extra power didn't make that much of a difference. Anyway,

we couldn't get hold of enough 80186s—the supplies just weren't there."

Copying Concerns

Another problem facing Corona is how to ensure that copy-protected software will work with the Mega PC. "There are some programs that use disk-based copy protection schemes, and these programs may have some problems finding what they want when they want to," said Toft. "Those programs that use the typical interrupt vectors should work just fine."

And, what about IBM's PC AT? "It's the best thing that could happen to us," said George McMurty, vice president of sales. "We felt we had a good idea of what IBM was planning and we were right. IBM and Corona are attacking the same market from different directions. We feel that the Mega PC offers the best performance for the price."

Shipments of the Mega PC are to start in September.

Laser Printer

Corona also introduced an IBM-compatible laser printer built around the print engine developed by Canon.

Although the Corona Laser Printer uses the same basic design as the LaserJet system announced by Hewlett-Packard earlier this year, at \$3,395 the Corona product is about \$100 less than HP's. While the HP LaserJet uses plug-in ROM cartridges to change typesets, the Corona system uses fonts and type size data stored on a PC-resident floppy disk. Currently, four different fonts are available, and these can be output in sizes ranging from 7 to 20 points. Further fonts and sizes will be forthcoming, Corona promised.

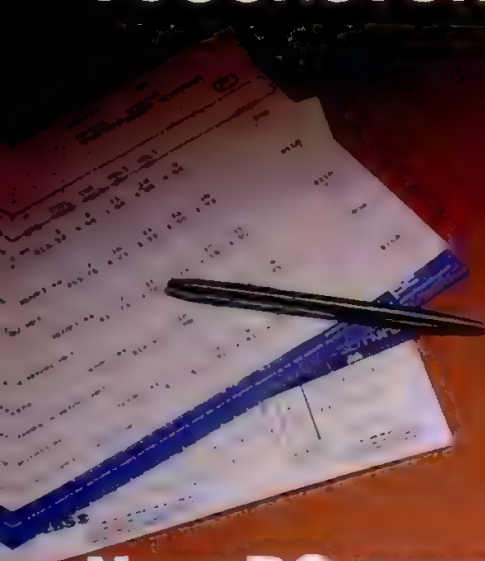
Single-sheet images can be composed of data taken from multiple screens; also, graphics and text can be intermixed easily. Up to eight pages can be printed per minute. Corona claims that any program that sends output to a standard printer device can drive the laser printer. Drivers for some popular programs have yet to be announced, however. ■

Speaking of Computers: Biology Is Destiny

"IBM compatibility is like pregnancy. You are or you are not."

Adam Osborne, *Hypergrowth: The Rise and Fall of Osborne Computer Corporation*

TOUCHSTONE 1



New PC power tool; cuts data-entry time in half.

While everyone else is jumping all over the place hunting for numbers one digit at a time, you'll be breezing along, entering whole strings of numbers without even looking...at your TOUCHSTONE 1™ rapid data controller.

Conceived by a financial analyst and PC user...

...Touchstone 1 was designed as a productivity tool for people who enter and revise numeric data...in spreadsheets, accounting systems, inventory control and similar applications. Touchstone means quick answers to important business questions.

The right keys...right at your fingertips...right now

Imagine...\$, %, and () for compound math formulas--without shifting. Separate cursor keys and efficient numeric layout let you forget the NUMLOCK ever existed. The Touchstone 1 has its own enter key, as well as backspace, space, home, period, comma, slash and equals, plus add, subtract, multiply and divide.

Reliable performance

The Touchstone 1 has its own unique microprocessor with 16-character buffer and patented Entry Error Elimination system. N-key rollover ensures positive

entry of every keystroke, even when a previous key has not been fully released.

Quiet full-travel keyswitches are rated for 50 million cycles; contacts are covered by a protective membrane to guard against dirt, dust and accidental spills.

Touchstone 1: Built so well it carries a full, one-year warranty, plus a 15-day money-back guarantee.

Superior ergonomics

Low-profile design meets DIN specs; reduces fatigue and back, neck and eye strain. Heavy-duty case is easily lap-portable, but won't slide around. Standard locating pip on 5 key, helps keep fingers where they belong.



Enter numbers twice as fast

Touchstone 1 data entry takes about 40% of the movement required with the standard PC keyboard. Even more important, you don't have to take the time to look for each digit.

An example; the formula:
 $((43818 \times 12) + (52 \times 147.3) / (47/12))$
Using the standard PC keyboard

(forget the PC number pad unless you can cope with the NUMLOCK), this formula takes 37 keystrokes including 6 shifts, and hand movement totalling 137 inches. With the Touchstone 1 keypad, the same formula is entered with 31 strokes, including NO shifts, and total hand movement of just 57 inches.

A plug-compatible workmate for the IBM PC and XT

Split cable and standard connectors allow you to use the Touchstone 1 alone or side-by-side with the main keyboard. When used together, any key can be entered from either keyboard anytime.

An investment in greater efficiency

Until now, numeric data entry has been the most tedious part of PC operation. If you have better things to do with your time, you really should consider investing in a Touchstone. Only \$169.95. Order by mail or phone for immediate shipment, or ask for it at leading computer stores.

CALL TOLL FREE

1-800-828-6968

In New York 1-500-462-4881

8am-9pm Monday thru Saturday

WRITE OR CALL READER SERVICE CARD



TOUCHSTONE
TECHNOLOGY, INC.

855 Buffalo Road • P.O. Box 24954
Rochester, New York 14624

To order by mail: Specify PC model number and payment by VISA, MasterCard or check enclosed. Credit card customers include complete card number and expiration date. Add \$3.00 for shipping (\$4.50 for Canada). New York state residents add 7% sales tax. Dealer inquiries welcome.

WE DRESSED OUR UNIX* SOFTWARE FOR YOUR IBM PC/XT



Try it Risk FREE — the first AT&T-licensed UNIX implementation for the IBM PC/XT. Shipping since August 1983, Venix/86 is the popular choice among knowledgeable UNIX users and developers. Here's why!

Multi-User Capability...

Share the same PC, disk, and printer with up to three users! Simply plug in a CRT and run.

Multi-Tasking...

Edit a file, print a report, run a spelling check, format a diskette...all at the same time.

Berkeley Enhancements...

Including vi, termcap, more and the c shell.

Real-Time Extensions

With semaphores, raw and asynchronous I/O, priority, shared data, I/O page addressing.

Quad-Screen Windowing...

Featuring four unique and powerful windows.

MS-DOS Partitioning...

Keep your DOS files and programs!

Lean and Clean...

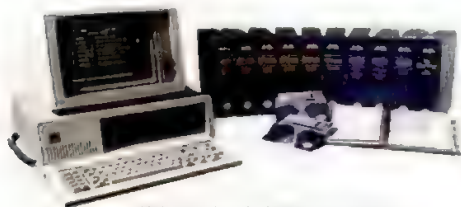
192K RAM, 3.5 Mbytes on disk. Proven reliability.

Applications...

Networking, word processors, database managers, spreadsheets, menu interfaces.

One Source with Unisource...

Unisource is the leading publisher and developer of UNIX software for the IBM PC/XT and compatibles, DEC Professional 350, Rainbow, Micro-11, PDP-11, VAX series, and NCR computers. All our packages are fully documented and supported by our 800 user hotline. Call for a complete information kit or to arrange your 30-day Risk FREE Trial of Venix/86. Unisource Software Corp. Department 4102
71 Bent St., Cambridge, MA 02141.
Telex 92-1401/COMPUMART CAM
CALL 617-491-1264



*UNIX is a trademark of AT&T Technologies, Inc.
Venix/86 implementation by VenturCom, Inc.

UNI SOURCE

**Getting UNIX Software
Down to Business**

CIRCLE 810 ON READER SERVICE CARD

PC Network Good News for LANs

In an 'Ethernet or Ether-not' world, will all network systems flourish?

BY MARTIN PORTER

NEW YORK—IBM's PC AT announcement stole the limelight from the simultaneous debut of IBM's broadband local area network (LAN) for PCs.

But, for those companies that have pioneered the concept of linking IBM PCs and compatibles to share files and peripherals, the announcement of the Sytek-manufactured LAN was met by a combination of expectation, confusion, and relief.

None of the major LAN manufacturers surveyed are running scared of this network, which will allow as many as 72 IBM PC and PC-compatibles to be linked with coaxial cable. Some call it expensive and only a Band-Aid approach to networking.

But most agree that, although limited, it will help to generate market acceptance of the network strategy, as well as to encourage the much-needed development of LAN software.

"The announcement clearly signals the next era of distributed computing," explains Bill Krause, president of 3Com, manufacturer of an Ethernet-style (fewer channel, baseband) LAN for IBM PCs. Krause continues, "IBM has endorsed the LAN strategy. This should help us all, especially those of us who offer an alternative approach."

Paradoxical Choice

Although both consultants and LAN vendors consistently expressed this sentiment, most were confused about IBM's choice of broadband technology in a traditionally baseband 75-ohm coaxial cable environment. Although the system can accommodate voice and video in addition to data transmission,

most consider it to be slower and more expensive than current market options.

"I'm still a bit puzzled by the selection," explains Dixon Doll of DMW Group, a research and consulting group in Ann Arbor, Michigan. "IBM's decision to introduce a broadband system was somewhat of a paradox," Doll says. "It seems that they wanted to make sure they didn't introduce the Xerox Ethernet protocol they have been fighting against for years. Their system is as close to being Ethernet as possible without being Ethernet." Doll suggests the product may be IBM's defense against AT&T's Information Systems Network (ISN), announced last summer with its PC-compatible computer line.

LAN Alternatives

Other analysts believe that this network is the first of an anticipated series of forthcoming IBM-endorsed LAN protocols. According to Ken Bosomworth of International Resource Development in Norwalk, Connecticut, "I think you will see IBM providing its stamp of approval for seven or eight LAN architectures in the coming months. IBM's interest isn't in LANs. It isn't terribly interested in black boxes or cabling. Its interest is where the money lies—in the workstations themselves."

Although 3Com's Krause maintains that IBM's new LAN divides the market into the "Ethernets" and "Ether-nots," others feel that the price of IBM's LAN leaves plenty of room for competitors, even those with similar products. Bob Davi, director of marketing for Orchid Technology, man-

ufacturer of the PCnet LAN, explains that with all pieces (boards plus translator unit) together, the new IBM PC network will cost nearly \$1,000 per node. This is double the cost of Orchid's baseband PCnet, which also operates in a 75-ohm coaxial environment. As a result, Davi adds, "If IBM did its job well, then this announcement will help the entire LAN marketplace. If it didn't, it will only hurt the concept of LAN."

Even those who read every product introduction for marketing clues have been confused about IBM's announcement of its new LAN. The clues don't add up. This is the third LAN IBM has announced. The market has given its cluster arrangement only lukewarm acceptance. And its token passing scheme, using twisted-pair cable, is still anticipated to take 2 more years in development.

As a result, Charles Hart, president of Nestar, manufacturer of the Plan 4000 token-passing LAN, remarks, "Tech-

nology of the broadband approach is somewhat of a detour. We are staying close to IBM's long-term plan, its announcement of a twisted-pair environment. This announcement seems to be nothing more than a bandaid."

Hart added, however, that Nestar will be introducing a gateway to IBM's broadband network early next year. Krause meanwhile says that 3Com will also announce ways to use its Etherseries of products with the PC AT.

Nevertheless, no one expects IBM's new LAN to generate de facto standards in its marketplace, which is expected to grow to \$3 billion a year by 1988. As John Murphy, analyst with Advanced Office Concepts of Bala Cynwyd, Pennsylvania, observes, "There are those timid users who will only buy a LAN with IBM's logo on it. And there are others who will accept this as IBM's endorsement of the LAN strategy and shop to see what is around." ■

PRODUCT REVIEW

A Wait Watcher's Delight

PC RESET

List Price: \$89.95,
\$99.95 with cable extension.

LOCKIT

List Price: \$129.95
Security Microsystems Consultants
16 Flagg Pl., Suite 102PF +
Staten Island, NY 10304
(212) 667-1019

Do you find it hard to resist snacking while anxiously waiting for your PC to meander through its turn-on memory check? And every time you have to power down and then up again to clear a hanging program, do you curse the idiot who left a simple hardware reset switch out of the PC's design?

If your PC is giving you a developing parity pot and incipient hypertension, Security Microsystems Consultants have a cure. Their PC RESET kit provides the button IBM overlooked and includes a plug-in module, called QUICKON, that bypasses the time-consuming

memory diagnostic routine. It is available for both the PC and the PC-XT (users must specify which) for \$89.95.

The PC RESET kit includes a free chip puller, which simplifies relocating the BIOS ROM in the QUICKON socket. Only a screwdriver and pliers are needed to install the RESET button, which is normally mounted in an unused cutout at the back of the computer. For users desiring a front-mounted reset switch, an extension cable with a Velcro fastener is available for an additional \$10.

Where hard disk security is required, Security Microsystems also manufactures a product called LOCKIT. This \$129.95 package includes the components of the PC RESET kit, plus a programmable password-access-only routine. LOCKIT may be set either to prevent any unauthorized boot-up of the computer at all or to intercept any attempted access to drive C:. —Craig L. Stark

Qubie' gives you the three Pluses: Quality, Service, & Low Prices

We were tempted to headline this ad with "The 1, 2, and 3 of why you should buy AST from Qubie." We are as tired of ads with that logo as you are, so we settled on three pluses. Actually, the plus really tells it better. The AST Research plus of quality is the reason they have the number one expansion products for the IBM PC. The Qubie Plus of service has made us the largest AST dealer. You don't supply the likes of IBM, Exxon, General Motors, and Lockheed, unless you have premier products and service. Top it all off with low, Qubie prices, and you have the reason tens of thousands of corporations, institutions, and PC owners have come to Qubie for their expansion needs.

Take Your Choice

We have the range of multi-function boards for IBM PC's and compatibles that gives you the choice of functions right for your needs. The AST Research MegaPlus II™ is the most flexible expansion product available for the PC. It's younger brother, SixPakPlus™ is the standard the competition measures themselves against. I/O Plus II™ is the answer for those who need serial and printer ports and automatic time and date loading, but already have their memory needs satisfied. Monograph-Plus™ is a multi-function monochrome graphics board. It offers the high resolution of the IBM monochrome board, along with flicker-free 1-2-3™ graphics, clock/calendar, printer port, and optional serial port.

Standard with Mega', SixPac' and I/O

is the award winning AST SUPERPAK software. You get SUPERDRIVE™ electronic disk emulation and SUPERSPOOL™ print spooling software.

MegaPlus II™

• \$229 includes:

- Clock/calendar with battery back up
- Asynchronous communications port, (RS232C serial, COM1 or 2)
- Memory sockets for up to 256K
- AST SuperPak Software & Q-Quick Menu

Options:

64k memory	\$55	GamePak	\$40
2nd async port	\$35	MegaPak 256k	\$299
Printer port	\$35	MegaPak 128k	\$199

SixPakPlus™

• \$229 includes:

- Clock/calendar with battery back up
- Asynchronous communications port, (RS232C serial, COM1 or 2)
- Memory sockets for up to 384k
- Parallel Printer Port (LPT1 or 2)
- AST SuperPak Software & Q-Quick Menu

Options:

64k memory	\$55
Game Option	\$35

I/O Plus II™

• \$149 includes:

- Clock/calendar with battery back up
- Asynchronous communications port, (RS232C serial, COM1 or 2)
- AST SuperPak Software & Q-Quick Menu
- One year Parts & Labor warranty

Options:

Game Port	\$35
Printer Port	\$35
2nd Async Port	\$35

MonographPlus™

• \$449 includes:

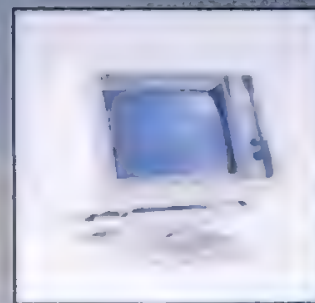
- IBM PC compatible Monochrome Card
- 720x348 1-2-3™ compatible graphics
- Clock/calendar with battery back up
- Parallel Printer Port
- AST SuperPak Software & Q-Quick Menu

Options:

Serial port	\$35
-------------	------

The Qubie' Plus

Good service starts with answering your questions before you buy. It continues with same or next day shipment of your order. And if your board ever needs service, we perform repairs in our own service department within 48 hours or we replace the board. You also get no cost extras like the Qubie bracket which allows ribbon cables to be mounted without interfering with other expansion slots. Or the Q-Quick Menu™ which provides easy arrangement of Super Drive's and the size of your SuperSpool printer buffer.



Free Monitor Stand with purchase of MegaPlus-256K or SixPacPlus-384K. \$39 value.

The Acid Test

Remember, our price is the whole price. No extra charges for shipping, insurance, credit cards, or COD fees. In a hurry? UPS 2nd day air service is just \$5 extra. If you are not completely satisfied with any Qubie product after 30 days, you can return it for a full refund. We will even reimburse you for the postage to return it. If you can get any of our competitors to give you the same guarantee, buy any other board you think compares and return the one you don't like. We know which one you'll keep.

CIRCLE 333 ON READER SERVICE CARD

IBM is a trademark of International Business Machines Corporation

Order Today, Shipped Tomorrow!

Price includes UPS surface freight and insurance. Add \$5.00 for two day air service. For fastest delivery send certified check or credit card. Personal checks take 18 days to clear. Calif. residents add 6% sales tax. Corporations and Institutions call for purchase order details.

(800) 821-4479

Toll Free Outside California

(805) 987-9741

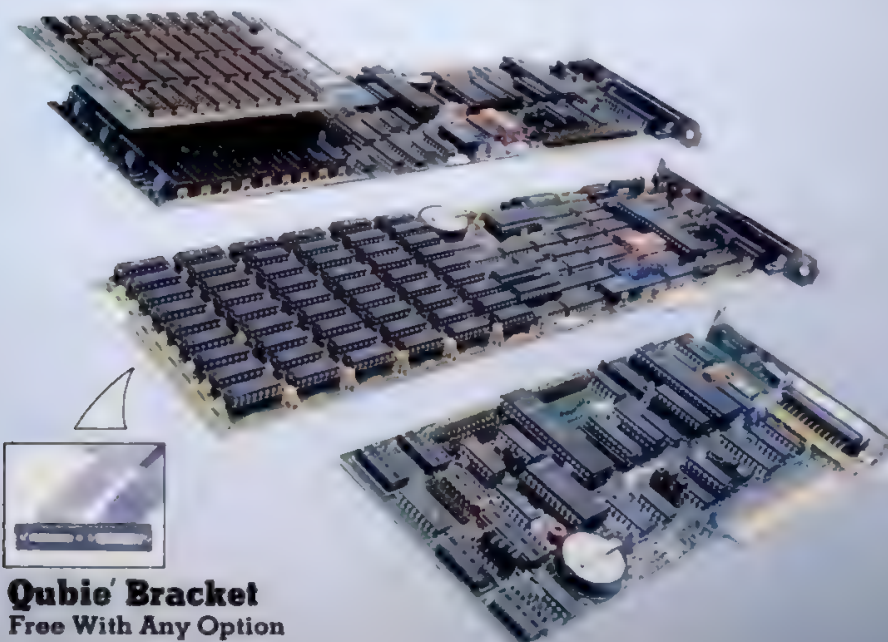
Inside California

QUBIE'

4809 Calle Alto
Camarillo, CA 93010

Tempo House, 15 Falcon Road,
London SW11 2PH, United Kingdom

Copyright Qubie 1984



Qubie' Bracket
Free With Any Option

WE CUT 'EM.



Our prices on IBM, IBM-compatible and Apple II, Apple IIe, and Apple II + HARD DISK SYSTEMS.

We've sold thousands of these super-reliable hard disks in the last 12 months.

However, if you haven't bought your **Mercury MegaBank** hard disk yet, you're in luck.

Now, the price is right.

The MegaBank Archive :
a complete **10-megabyte** hard disk
for use in the second floppy bay of
your PC

ONLY:
\$795

The MegaBank 10:
a complete **10-megabyte** single bay
hard disk system

ONLY:
\$995

The MegaBank 20:
a complete **20-megabyte** single bay
hard disk system

ONLY:
\$1,495

The MegaBank 40:
a complete **40-megabyte** single bay
hard disk system

ONLY:
\$1,995

The MegaBank Streamer:
a solid-cartridge **tape unit** that
plugs into your PC to back up your
MegaBank 10, 20 or 40. Copies up
to 20 megabytes, in approximately
seven minutes, & no extra slot
is required.

ONLY:
\$995

You'll be up and running in minutes. With MegaBank, you simply add the included adapter board to your PC chassis, plug in the hard disk unit, and turn it on. Everything you need is included, so don't worry about tricky installation or "extras".

And every MegaBank product is fully supported by our "no-risk" customer service network. We're standing by with a User's 800 Line to provide answers to technical questions or to give you helpful hints.

Every MegaBank component is warranted for a full 90 days.

Finally, if you aren't satisfied — for any reason — just return your order to us within 30 days. On the day we receive it, a full refund check will be on its way to you. When we say "no-risk," we mean it.

**TO ORDER OR FOR MORE INFORMATION,
CALL 800-551-7666.**

In Illinois, 312-951-0616.

We accept Visa, Mastercard and American Express, and we'll ship within 48 hours of receiving your credit card order or check.

There is an additional charge of \$33 per item ordered for shipping, handling, and insurance.

Specifications:

All Megabank drives are 9 $\frac{3}{8}$ " wide by 5 $\frac{3}{8}$ " high by 14 $\frac{1}{2}$ " deep.

Runs on your IBM compatible with DOS 2.0, 2.1, or CP/M 86. Apple compatibles: DOS 3.3, ProDOS, 1.01, CPM and Pascal.

Average access time 93M Sec. with a 5.0 Bits/Sec. transfer rate.

IBM® and  compatible

Mercury MegaBank Corporation
311 West Superior Street Dept. 416
Chicago, IL 60610

IBM and Apple are registered trademarks of International Business Machines, Inc. and Apple Computers, Inc.

10 meg shown

CIRCLE 160 ON READER SERVICE CARD

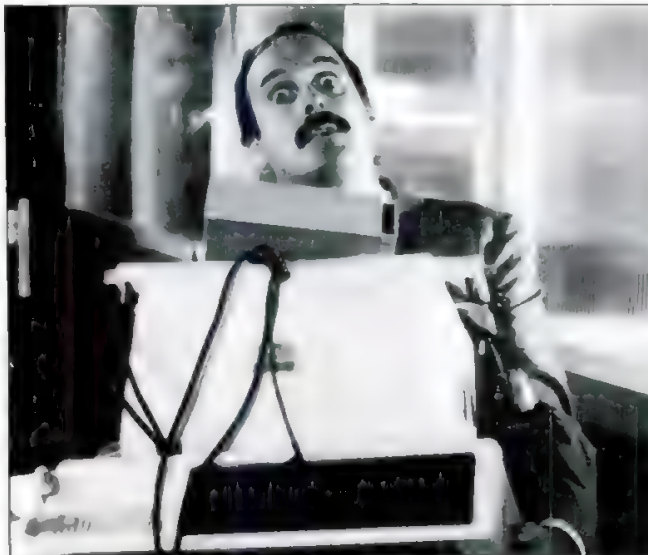
Cleese Pitches Compaq And Tosses a PC

BY JAMES LANGDELL

HOUSTON—Compaq found a new way to emulate IBM: it hired a comedian to sell its personal computers. IBM may have Charlie Chaplin, but Compaq's pitchman is John Cleese, the short-fused, tall actor-writer of "Monty Python" and "Fawlty Towers" fame.

Unlike Chaplin's gentle, silent comedy, Cleese's humor has a sharp, verbal edge. You can't possibly ignore him when he speaks. "Cleese's delivery is second to none," says Jim D'Arezzo, Compaq's vice-president of corporate communications. Cleese is an effective hired gun as actor and writer in four of Compaq's television commercials, produced by Ogilvy & Mather. The spots are targeted at Compaq's chief competitors, IBM and Apple.

"We analyzed the marketplace," says D'Arezzo, "and concluded that a computer purchaser's biggest fear is making the wrong decision." In the commercials Cleese portrays someone who made what Compaq believes is the wrong deci-



sion—he bought an IBM or Apple personal computer. In each spot Cleese crumples when confronted by the calm voice of Compaq's off-screen advocate.

In an ad for the Compaq Plus, for example, Cleese has his arms filled with an IBM PC's system unit, keyboard, monitor, and manuals that he's trying to carry home from the office. The

voice tells him the portable Compaq Plus can do more than his unwieldy stack. Cleese asks, "Does it have a handle?" just as the PC slips and crashes to the floor.

Another ad casts Cleese as a stodgy businessman, proud to

most savage shots occur in a commercial targeted at Apple's Macintosh. Cleese portrays a trendy California executive, dressed in jogging suit and towel. A Macintosh sits on his glass-and-chrome desk. Cleese is so laid back he begins to slither out of his ergonomically designed chair. The Compaq's portability doesn't interest him: "My horoscope advises against travel." And when told that "Compaq can grow as your needs grow," he shares this thought: "But isn't personal growth more important?"

Cleese, educated in law at Oxford, is serious about the crafts of comedy and acting. "The script's words can be flat, but what he does with them is marvelous," raves D'Arezzo. "For example, there's not much in the line 'Does it have a handle?' But the way Cleese delivers it after a long pause gets a belly laugh."

It's not only Compaq's D'Arezzo and die-hard "Monty Python" fans who appreciate Cleese's talents. In recognition of his performances for such clients as Compaq, American Express, and Krønenbourg beer, *Advertising Age* recently declared Cleese the star presenter of the year.

By going with Cleese, Compaq clearly made "the right decision." ■

The Big Fix: IBM PC Service Takes a Step Up

FRANKLIN LAKES, N.J.—It is no longer necessary to reach for the panic button when your IBM PC goes on the blink. As of October 1, IBM inaugurated a new maintenance agreement that is designed to offer more customers convenient access to service and repair. IBM also announced maintenance coverage for the non-IBM products IBM sells in its product centers for use with the PC.

A notice sent to IBM customers in June explained five service offerings now available for IBM equipment: IBM on-site repair, IBM on-site exchange, customer on-site exchange, cus-

tomer carry-in exchange, and customer carry-in repair. "We'll give the customer a price break, depending on what he's willing to do," explains Jack Kessler, service business adviser in IBM's customer service division, about the benefit to customers who transport their own machines, for example. "The more he does, the less he pays for maintenance."

Customers may now choose to either mail or personally deliver machines to any of 100 IBM Service/Exchange Centers. These centers perform minor maintenance, such as exchanging machines or replacing

parts if they're in stock. If major repairs are needed, the machine is delivered to one of seven IBM Repair Centers and, once fixed, it can be picked up by the customer at the Service/Exchange Center or mailed to the customer's home or office. Cost will vary accordingly.

Customers can also request IBM on-site service, IBM on-site exchange, or customer on-site exchange. With on-site maintenance, customers can choose to have IBM perform all maintenance on location or they can assume responsibility for on-site repair once the parts or replacement machine is delivered by IBM.

For non-IBM equipment, IBM maintenance will service two types of printers and seven feature cards. The four types of

service offered for printers are IBM on-site exchange, customer on-site exchange, customer carry-in exchange, and customer carry-in repair. For feature cards, customers can choose IBM on-site repair or customer carry-in repair.

IBM spokesperson Helen Horwitz says that, while IBM will service non-IBM machines, customers should first check to see if the equipment is still covered under the manufacturer's warranty. However, IBM will provide service for any product for customers who request it.

Customers who need service should call the nearest IBM authorized dealer or IBM's national toll-free number, (800) 428-2569. From Hawaii or Alaska, call collect at (312) 986-7451. —Virginia Dudek


```

cution began:

 breakpoint encountered at 0647 00D7: JTOCM_CODE0116
      REAL TIME SOURCE CODE TRACE DATA
E      SOURCE or MODULE
      LINE      MARK
-----
      Fahr = lower;
      while (Fahr <= upper) {
          Compute (Fahr, &calsion);
          *c_lcomp = *c_lcomp - 1;
          *c_lcomp = *c_lcomp + 1;
          *c_lcomp = *c_lcomp / 2;
      }

r= 0
siubr -12
er= 100
p= 10

ign BP BYTE Compare Console Delete Dis DMA Echo Edit EMacro Eval File
rg Go IF INIT Interrupt List Load Ld Edit Macro MEMem MODULE Move
ran's Source Code Debugger Version X010 (C)Copyright Atron Corp. 1984

```

ATRON Announces A State of the Art Advance in Source Level Software Debugging

ITT XTRA Bats 1.000, Mets Send XT to Showers

Team pins Series hopes on compatible

BY JAMES LANGDELL

NEW YORK—Will computing become the new national pastime?

On August 31 the New York Mets held Computer Night at Shea Stadium. This baseball team has good reason to celebrate computers: Its manager, Dave Johnson, led the Mets to their best season in over a decade with guidance from his personal computer.

Fans of ballpark giveaways, such as Cap Night, were disappointed that only one Computer Night ticket holder received a free computer—an ITT XTRA, just like Johnson's.

Hold everything! At the time of our spring scouting report ("The PC Goes to Bat," *PC*, Volume 3 Number 10), Johnson was using an IBM PC-XT. Why did he switch computers in mid-season?

For the answer, we talked to Johnson's computer dealer, Steve Guido, president of ComputerLand of Queens. When he was second baseman for the Orioles, Johnson worked with Guido at Honeywell in Baltimore during the off-seasons.

Last spring, ITT delivered an XTRA to Guido in advance of its official announcement of the computer. Guido had signed a nondisclosure agreement, but he gave Johnson a sneak pre-

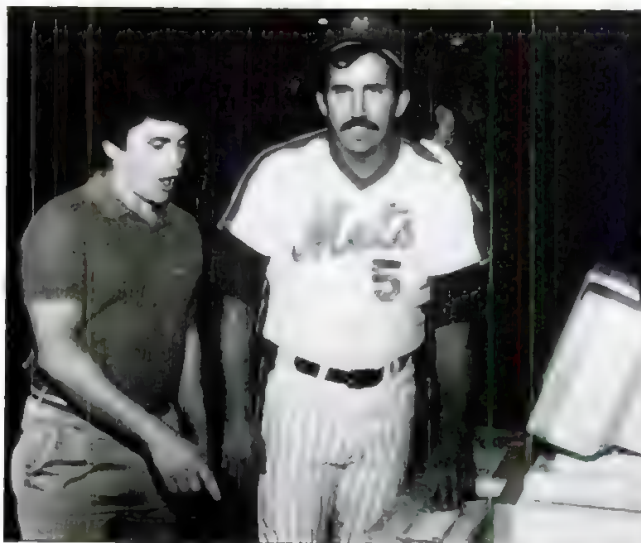
view. The Mets' manager tried running the team's statistical software (designed with *dbase II*) on the XTRA and found it ran faster than on his PC-XT.

Impressed by the XTRA, Johnson was eager to get one as soon as they became available. He was so eager that when a reporter asked him what moves could improve the Mets, he said, "Trading my XT for an ITT computer and a player to be named later." This may be the only time a computer scoop broke first in the sports pages.

Name Game

Back to Computer Night... The Mets also awarded an XTRA to the winner of a contest to name Johnson's computer. The best name, Abner Doubledata, was coined by Matthew Carlton, of Woodside, New York. Carlton had filled out the last entry form at one of Guido's ComputerLand stores, just as it closed on the contest's final day—proving that baseball is a game of split second decisions.

Carlton is a performer and songwriter; his wife, also a musician, runs a vocal studio. They plan to use the XTRA not to play music, but to maintain business records for her studio and to handle copyright forms for his songs. They already own



Matthew Carlton, Dave Johnson, and "Abner Doubledata" at Mets' Computer Night.

a Commodore 64, but Carlton admitted he was a little intimidated by the more powerful computer.

When Carlton's winning name was announced at Shea Stadium, much of the crowd booed and groaned at the pun. Abner Doubledata would have gotten more respect if the fans knew some of the other names in its league: Byte Boy, Byte Ball, Perfect Coach, and Byte Fielder.

It's a Miracle

Another one of the Computer Night events was a computer-simulated game between the 1984 Mets and the World Champion "Miracle Mets" of 1969. This time-bending matchup was made possible by *Micro League Baseball*, a computerized baseball game based on the statistics of actual major league players. This software, soon to be available for the PC, is produced by

the Micro League Sports Association, 28 East Cleveland Ave., Newark, DE 19711, (302) 368-9990.

As in real life, Johnson managed the 1984 Mets, while Ed Kranepool, a veteran of 1969, called the shots for his teammates. The game had the makings of a pitcher's duel between 1969's Jerry Koosman and this year's Dwight Gooden. In this *Silicon League* game, fleshed out with film clips of the players, the 1969 Mets led 4 to 3 after the seventh inning. With two out in the bottom of the ninth, however, the 1984 Mets scored the two runs needed to win the game, 5 to 4.

This dramatic conclusion seemed somewhat calculated. A *New York Post* reporter asked the Mets' manager if his computer had rigged the game. No, replied Johnson, "but if we were losing I would have pulled the plug."

Prototype Puck Pointer May Be Future Mouse

BY ROBIN WEBSTER

OAKLAND, California—Mice, light pens, joysticks, and touch screens are all trendy techniques to tell a personal computer what to do.

While such input devices definitely work, they all require that the user move one hand

away from the keyboard and, in some cases, turn their gaze away from the computer screen. To many, the temporary loss of contact with the keyboard is of negligible concern. Others find it a confounded nuisance.

However, a California-based

company called the KA Design Group believes that it has overcome many of the major objections to these alternative input devices. Its hybrid Puck Pointer has no mouse "tail," and it doesn't need to be separately attached to a PC via an RS232 serial port.

The Puck Pointer combines optical mouse and joystick technology and is compact enough to replace the 2-by-2 inch numeric/cursor control key area on the IBM PC's keyboard.

Traditional mice use a ball

bearing on their undersides that, via small sensors, constantly communicates x-y coordinates to a computer system. They can be used on any surface that provides enough friction to cause the ball bearing to rotate as the mouse is moved around.

Optical mice use a different method; they note how fast and in what direction they are being moved over a special "pad" that has been etched or painted with a grid pattern. The grid pattern acts as a point of reference from

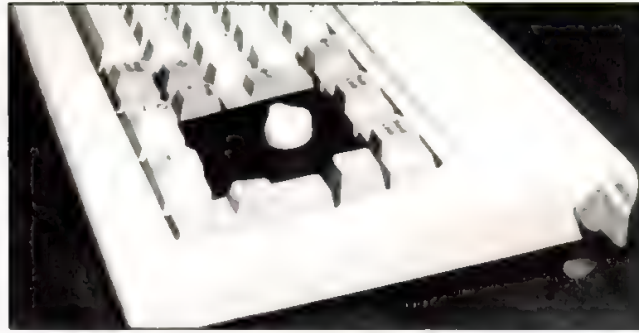
(continued)

Puck Pointer (continued)

which x-y coordinates are calculated.

The Puck Pointer, according to KA Design's president, Victor Kley, is an "optical, non-contact device that is far less cumbersome and more natural to use. It doesn't put as much strain on the hand, wrist, and arm muscles."

It features a single "handle" that can be moved north/south and east/west. This controls an on-screen cursor, or carries out any other action dictated by software. Pressing down on the "handle" provides a third di-



The Puck Pointer can replace the numeric/cursor control keys on the PC.

mension of movement.

"This third axis of movement can be used to control a number of actions," said Kley. "It might

control the speed at which images are drawn, or it might dictate how fast the cursor will move. You can 'ratio' the move-

ment of the Puck Pointer and the cursor on the screen; you might move as little as half-a-pixel and as much as 16 pixels at a time.

"In one mockup we showed how the Puck could be installed on an IBM PC keyboard in place of the numeric/cursor control keys. Although we are not currently producing such a product commercially, I can see us marketing a product for the end-user that comes as an add-on for about \$40. Initially, we will be selling the basic device to OEMs for about \$15 per unit in 10,000 unit quantities".

Calendar of Events

DATE	EVENT	COMMENT	LOCATION	CONTACT
October 11-14	Computer Expo and PC Show	Exhibits, seminars, and workshops.	Cal Expo Sacramento, CA	High Tech Shows, Inc. 2020 Hurley Way, Suite 395 Sacramento, CA 95825 (916) 924-9351
October 25-26	CAD/CAM: A Management Overview	Seminar on philosophy and benefits of an integrated system.	Holiday Inn- International Airport Minneapolis, MN	Institute for Advanced Technology 6003 Executive Blvd. Rockville, MD 20852 (800) 638-6590
October 29- November 1	COMDEX/Europe	Hardware, software, and accessories.	RAI Congress and Exhibition Centre Amsterdam, The Netherlands	The Interface Group 300 First Ave. Needham, MA 02194 (800) 325-3330 (617) 449-6600
November 1-4	Consumer Electronics and Computer Expo	Selling show featuring consumer electronic and computer products.	Nassau Coliseum Uniondale, NY	Expositions Inc. 33 Bell St. W. Babylon, NY 11704 (516) 293-5533
November 2-4	Regional Educational Software Informart	Seminars on educational software developments.	Penta Hotel New York, NY	National Educational Software Informarketing 225 E. 57 St., 17H New York, NY 10022 (212) 688-8904
November 4-7	Eighth Annual Symposium on Computer Applications in Medical Care	Tutorials, demonstrations, and exhibits on computer applications in health care.	Washington Hilton Washington, DC	Office of CME George Washington University Medical Center 2300 K St., N.W. Washington, DC 20037 (202) 676-8928
November 14-18	COMDEX	Hardware, software, and accessories.	Las Vegas Convention Center Las Vegas, NV	The Interface Group See above
December 6-8	Great Southern Business & Computer Shows & Seminars	Hardware, software, accessories, and seminars.	Leon County Civic Center Tallahassee, FL	Great Southern Computer Shows P.O. Box 655 Jacksonville, FL 32201 (904) 356-1044

Dressed for Success



Custom tailor your software with ProKey™!

Off-the shelf software is like an off-the-rack suit.
It never fits your needs exactly.

Which is why RoseSoft created ProKey.

ProKey is a powerful software tool that lets you tailor fit ordinary off-the-shelf software to the one-of-a-kind needs of your business.

It makes available over 300 'user definable function keys'—abbreviations for text or command sequences.

And when one keystroke can do the work of dozens, you increase your productivity and dramatically reduce errors.

Now your spreadsheet works as though it were designed for your business. Your word processor is set up for writing your memos (or screenplays). And your

communications package knows your passwords and how to log onto the company mainframe.

Your software understands how you work and remembers the commands you use most frequently!

You can try ProKey on for size at computer stores everywhere. And send for our free 16 page booklet, "Boost Your Productivity with ProKey."

 **RoseSoft™**

4710 University Way N.E.
Seattle, WA 98105
(206) 524-8595



CIRCLE 438 ON READER SERVICE CARD

To run ProKey you'll need an IBM PC, XT, or compatible computer, and DOS (any version including 2.1). Corporate and OEM discounts are available.

PRODUCT REVIEW

Cope 100-106: PC as Electronic Couch

BY HOWARD A. KARTEN

Cope Series

- #100 *Condition Green* (For Success)
- #102 *Wings* (Fear of Flying)
- #103 *Counterweight* (Reduce Overeating)
- #104 *Center Stage* (Public Speaking)
- #105 *ZZZZZZ* (Insomnia)
- #106 *The Big Idea* (Self-Confidence)

Cabononics, Inc.

6325 Sheridan Dr., #1
 Williamsville, NY 14221
 (716) 631-5777

List Price: *Condition Green*, \$60; others, \$65 each;
Condition Green plus any other program, \$100.

Requires: 64K RAM.

Psychologists, like other professionals, have lately begun to investigate the potential for delivering their services by computer. One approach that's received considerable attention is behavioral therapy, a specialty within psychology and psychiatry that has had some notable successes in dealing with certain behavioral difficulties. Behavioral therapy places less emphasis on the client's feelings ("How did that make you feel?") and "What were you feeling when you said that?") and focuses on observable and controllable behavior.

Plucky Plunge

The six programs in Cabononics' Cope Series attempt to deliver some of the behavioral therapist's services via what might be called the "electronic couch." The problems they address are difficulties in sleeping, fear of flying, overweight and overeating, stress, self-confidence, and generally feeling good about oneself. The advertising material for this software carefully avoids any mention of words such as "problems," "disorders," "therapy," and so on (no doubt for reasons of professional ethics regarding advertising, lawsuits, and re-

lated concerns).

These programs are a plucky step forward, but unfortunately they seem to be more of a lurch than a sure-footed step. They will require some polish to achieve greater effectiveness.

The authors are two psychiatrists who are diplomats, having passed advanced tests administered by the American Board of Psychiatry and Neurology. They have adapted to PCs a proven approach to dealing with behavioral difficulties. The method used is classical, or Pavlovian, conditioning, in which two events or emotional states are paired. For example, someone with fear of flying gets anxious literally at the thought of air travel. According to the paradigm, reducing the physical anxiety level that accompanies those unsettling thoughts will relax the person's fear about flying. That goal is achieved by placing the sufferer in a very relaxed state and getting him or her to simultaneously imagine all the stimuli of flying—for example, buckling up the seat belt, the roar of the engines, and the plane's takeoff. Getting the sufferer into the relaxed state is accomplished through thoughts and phrases displayed on the CRT. It's an interesting idea, but it receives less-than-elegant execution in this case.

Flying Help

To use these programs, you simply put one of the disks into drive A: and perform a standard boot; the operating system has already been placed on the disks. You are asked to get into a comfortable position in a place free of distractions. The programs then ask you a few basic questions (your name, gender, is it night or day, what season is it), and inform you that the only action necessary to use them is to press the minus key on the numeric keypad to display succeeding screens.

The CRT then displays basic instructions as well as a mixture of different kinds of thoughts and phrases. Some are intended to raise your anxiety level ("You are on a plane. The plane has just begun to take off...you are trapped...maybe the pilot is drunk."). Others are intended to relax you (the feelings of terror "are draining out of your body, soaking into your chair"). The intent is to alternately raise and lower the anxiety level and make the user as relaxed as possible so he or she will be amenable to suggestion.

Unfortunately, the implementation is amateurish and almost guaranteed to conflict with being in a relaxed state. For example, sitting in front of the tube and making a bit of an effort to read the displays seems innately less relaxing than listening to a voice on a tape. Moreover, after you press the minus key on the numeric keypad, the software forces you to wait a few seconds before displaying the next screen (which is never more than 4 lines, at a maximum of 40 characters each).

Disruptive Messages

The phrases come on to the screen one character at a time, which I also found not-relaxing. A better technique, I think, might have been to display the messages a line at a time, starting with a low intensity and slowly turning up the brightness level.

Finally, the message displays between presses of the minus key are not broken up logically into complete thoughts or phrases—they're disjointed, which makes them distracting and difficult to comprehend.

I described these programs to Dr. Larry Stifler, a Boston-area clinical psychologist and director of Boston-based Health Management Resources, a company that helps clients deal with behavioral problems such as

obesity or overeating. Stifler, who's done extensive research as well as behavioral therapy with individual clients, observed, "Generally, I feel there's a great future to self-instructional material delivered via computer. The issue is designing the software so it's effective."

Moreover, he stressed, "The computer is ideally suited to shaping behavior. The advantage of the computer over purely auditory tapes in principle is that the program can ultimately be made interactive, which makes it much more individualized and self-pacing than a traditional auditory tape."

Sense Conflicts

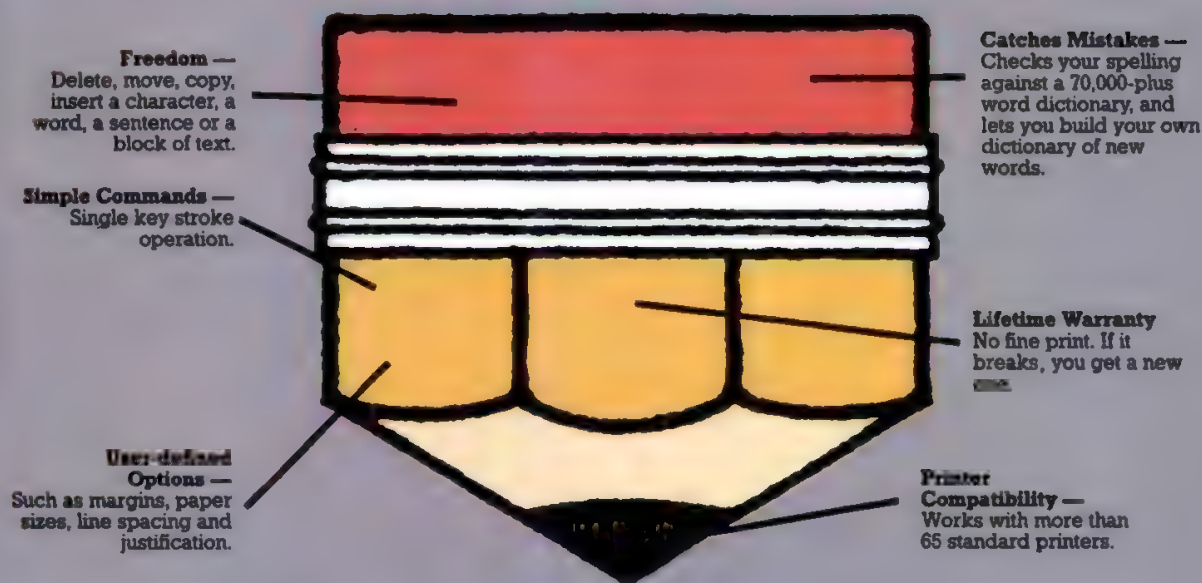
One potential problem Stifler pointed out was the need to keep pressing the minus key, since that effort "is the antithesis of relaxation and could interfere." A better method might be to use the button on a game controller or a joystick, he said. "If some muscles are tense from having to press the button, you're delivering a mixed message to the brain." Stifler feels that this prevents the program from being as effective as it might be if it required less effort on the user's part.

The problem, Stifler explained, is that none of the tasks to be performed should be incompatible with a relaxed body and relaxed muscles. Having to concentrate on the screen and interpret phrases that might not be full sentences is incompatible with a state of relaxation.

For the immediate future, however, I suspect that those who are tempted to deal with their difficulties by plunking down the \$60 or \$65 for these programs would be better advised to spend the money on a cassette tape or a bottle of their favorite mood-altering beverage. Or, at minimum, they should wait for the next release.

The hardware requirements are not stated, but it appears that a minimum of 64K and a monochrome system are needed. The disks already have an operating system written on to them. ■ Howard Karten is a programmer-turned-writer who has a B.A. in psychology.

Compared To FRIENDLYWRITER FRIENDLYSPELLER A Pencil Is Tough To Operate.



FriendlyWriter™/ FriendlySpeller™, the word processor and spelling-checker from FriendlySoft is so easy to use it makes writing with a pencil seem difficult.

In about 10 minutes on your IBM® PC, XT or PC Jr, you can learn to write rings around your pencil. And you can check the spelling of more than 70,000 words in another few seconds.

FriendlyWriter/ FriendlySpeller is the perfect word processing package for home and office. Visit a computer or software dealer near you and ask for a demonstration. If your dealer is not stocking it, let us know.

FRIENDLYWRITER/FRIENDLYSPELLER Only \$85.00

Suggested Retail Price

FRIENDLYSOFT INC.

3638 WEST PIONEER PARKWAY, ARLINGTON, TEXAS 76013
(817) 277-9378

IBM is a registered trademark of International Business Machines.

Price subject to change without notice
FriendlyWriter/FriendlySpeller are trademarks of FriendlySoft, Inc.

© COPYRIGHT FRIENDLYSOFT, INC. 1984

Elizabeth Ferrarini

This 'infomaniac' pursues modern love with modem romances

BY CHARLES BERMANT

BOSTON—You might know her as Liz the Lusty. Or Baudy Brenda. Or just plain "Baud." Under these aliases, Elizabeth Ferrarini haunts The Source, CompuServe, and other telecommunications services, putting out a computer siren song, in search of able-bodied men.

Ferrarini makes telecommunications fit her own needs. She not only turned the tables and broke taboos by advertising her personal needs, but she wrote a book about the experience. And the result, *Confessions of an Infomaniac*, published by SYBEX Inc., in 1984, is far from the typical computer book.

When Ferrarini, 36, first used The Source three years ago, she was a computer novice. She was also at a personal crossroads, having left a middle-management position for Journalism school.

Upon graduating, she was commissioned by Prentice-Hall to write about on-line services, and part of her research of available electronic avenues was an exploration of The Source. She was enthralled with its news, "chat," and all the other services but was most fascinated with the dating bulletin board.

Moreover, she noticed something else: All the advertisers on that board were men. Her own ad received 20 responses the first day.

"I was captivated by what was happening, though I really didn't know what to do with it," she relates.

A Lighter Touch

Once hooked on The Source, her priorities changed. She decided to write a lighter book to reflect what she was experiencing with The Source at the time.

However, her publisher didn't approve and cancelled her contract. *Infomaniac* was not what he had asked for. Later, while seeking a publisher for another book, she mentioned the abortive project to SYBEX editors, who jumped at the chance to



publish the already completed manuscript.

Confessions of an Infomaniac is much like the title suggests. It is a personable, chatty recount of the author's initiation to the electronic age, starring some of the men she met on-line. Most of the book is true, at least from the author's perspective.

But, like the electronic relationships it discusses, the book promises more than it delivers. For instance, it promises to titillate, but, despite flashes of wit, it doesn't even get interesting until it's almost over. It's no fun trying to get on-line for the first time, and it's even less fun reading a detailed description of another user's efforts.

Ferrarini acknowledges the criticism, saying "it's better to get published miserably than not at all." She says she accomplished what she set out to do, adding that people "either love or hate" the finished product.

"You are a moving target when you do this," she explains

about her on-line exploits. "You are communicating your needs, so people will take potshots. One of the frequent questions is 'if you're so attractive, why do you need a computer to meet men?'"

"It's convenient. The odds are in a woman's favor. The response is quick, and, since both people are paying to communicate, it is an equalizer. And as computer users, you have automatically shared some of the same experiences."

Needs Statement

She says she has never landed in an uncomfortable or physically threatening situation. The "screening out process," so far, has worked. In addition to developing some romantic relationships, she has also been able to meet people who will help her in her career—perhaps to bring *Infomaniac* to the big screen.

She has also turned *Infomania* into a concept, making a legal claim to the term and using it as a title for her next book. "Infomania: A Guide to Essential Electronic Services," which is slated for publication by Houghton Mifflin next spring. This book is what Ferrarini set out to write before she was sidetracked by electronic lust.

Revamped Book

With her second book, Ferrarini strives to inform users about all the services available to them, advising them about alternatives for getting information, plus giving specific advice. For example, she says many search services previously used by librarians are being pitched to the end user.

"I want to give the reader a sense of the various services

available, an idea of what the database gives you for \$80 an hour," she relates. "Most computer communications books spend a lot of time telling you how to get on-line, but they don't tell you what to do once you get there. I want to tell about all the services without a lot of computer linguini.

"People form opinions about you based upon their electronic facade, which is not necessarily who you really are," she says. "The computer allows me to create any facade I want."

Modem-Packing Mama

Ferrarini's own facade—that of a bawdy, tough-talking broad—belies her slight physical presence. When a Source bulletin board user accused her of being a gay man rather than a heterosexual woman, she let loose with a string of descriptive expletives for about 15 minutes, at which time it was deleted by Source censors.

"On The Source, people are paying to communicate and self-publish," she insists. "No one has a right to say what is offensive. There should be no censorship."

She didn't clean up her act and was recently kicked off The Source for harassing a West Coast user who had criticized her for using a *Parti* conference on electronic love to plug her book. The user called her a slut, and Ferrarini responded with disparaging comments about that user's race, weight, and dentures.

"That kind of comment brings the street person in me out," she says. "If someone says something nasty to me, then I'll come back."

Electronic Backlash

The upcoming *Infomania* directory could develop into a yearbook or a newsletter, and Ferrarini is keeping as many modems in the fire as possible.

She has not, however, acknowledged any of the brutally pornographic electronic mail she has received on The Source.

"It's like I don't want to be a player in my own game," she confides laughing. "I'd rather watch other people." ■

"MANAGING YOUR MONEY"TM is, simply, the finest personal financial management program on the market."

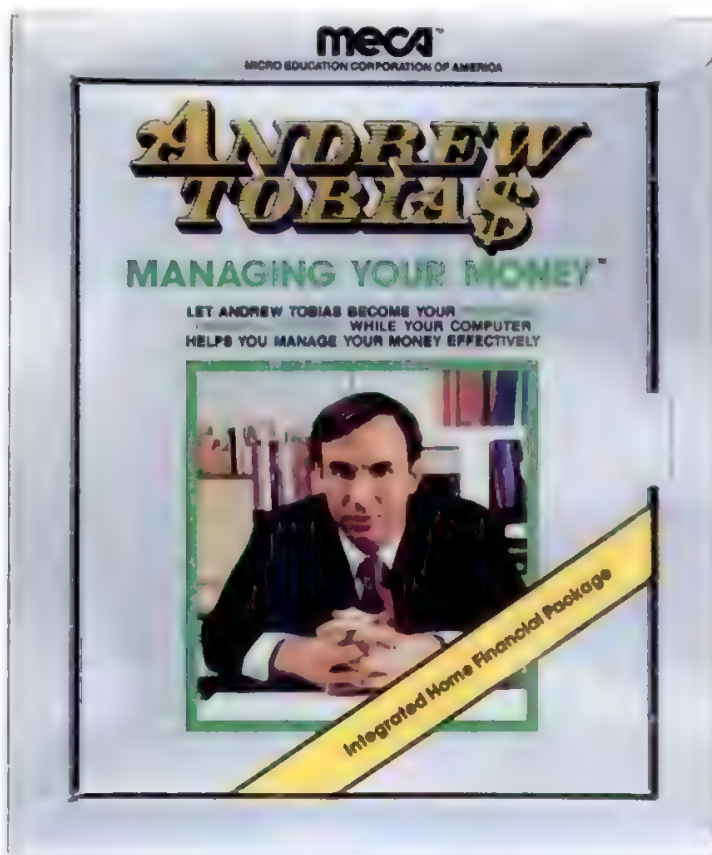
PERSONAL SOFTWARE MAGAZINE, JULY, 1984

"The first
fully-integrated
financial program
that really makes
a computer for
the home worth
the money."

SEYMOUR MERRIN
COMPUTER WORKS OF CT

"MANAGING
YOUR MONEY
is the most
complete home
finance package
I've seen. It's
also about the
most easy-to-use
software
package I've ever
encountered."

KEN USTON'S ILLUSTRATED
GUIDE TO THE IBM PC



Disk version for IBM PC, XT, Compaq and now for PCjr with 256 K. Cartridge version available for PCjr at IBM authorized dealers.

Andrew Tobias'
new program
"can explain the
most complex
personal finan-
cial dilemmas
with impressive
clarity and
frequent twists
of wit."

FORBES,
APRIL 9, 1984

"You'd expect
MANAGING
YOUR MONEY
to be difficult
to use and full
of financial
jargon. It isn't."

COMPUTE'S PC & PCjr,
MAY, 1984

The only financial software you'll ever need. The easiest financial software you'll ever use.

It's seven programs in one. It prepares your budget and balances your checkbook.

It calculates your net worth. It helps manage your stock portfolio. It calculates your taxes.

It estimates your life insurance needs. It analyzes loans and helps you do retirement planning.

It reminds you of important dates. No need for a big, bulky manual.

With MANAGING YOUR MONEYTM all the help you need is constantly on-line, on the computer.

And everything is integrated so you only need to enter data once.

MANAGING YOUR MONEY Owners:

We've made improvements and 1984 tax revisions!
Send in your warranty card for free update.

mecaTM

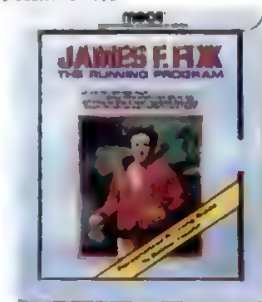
Software that makes your
personal computer worth having.TM

© 1984 • MICRO EDUCATION CORPORATION OF AMERICA • 285 RIVERSIDE AVENUE • WESTPORT, CT 06880 • (203) 222-1000

Other fine software products from MECA



For Atari, Apple and IBM



For IBM

Available where fine software is sold

CIRCLE 151 ON READER SERVICE CARD

Tektronix 40XX Terminal Emulation

EMU-TEK™ IS NOW AVAILABLE FOR IBM PC, XT, AND MOST COMPATIBLES

- Access powerful mainframe graphics using:
 - PLOT 10 (trademark of TEKTRONIX, Inc.)
 - DISSPLA (registered trademark of ISSCO)
 - SAS/GRAPH (trademark of SAS INSTITUTE, Inc.)
 - DARC (available from QUESTEL, Inc.)
 - and most similar packages and services.
- Upgrade from dim storage tubes to bright raster scan technology, with complete software compatibility.
- Increase versatility with options such as:
 - High resolution board support (HERCULES, etc.)
 - Local pen-plotter support (HP, AMDEK, etc.)
 - Hard copy on EPSON or IBM matrix printer
 - LIGHT PEN for graphic input
 - Advanced communications program features
 - Other terminal emulations, including:
 - VT100 (trademark Digital Equipment Corp.)
 - ADM3 (trademark Lear Seigler, Inc.)
 - RETRO-GRAPHICS (trademark Digital Engineering, Inc.)
- **\$395.00 PLUS OPTIONS**
- **30 DAY NO-RISK TRIAL PRIVILEGE.**

Call or write us, or see your participating dealer.



FTG
DATA SYSTEMS

FTG will soon become PC INNOVATIONS

10801 Dale St./P.O. Box 615
Stanton, CA 90680
(714) 995-3900

THE LIGHT PEN FOR YOUR PC IS NOW EVEN BETTER!

- New photo-optical push-tip switch for super reliability.
- **30 DAY NO-RISK TRIAL PRIVILEGE**, and **TWO** year limited warranty.
- Ideal keyboard alternative for INTERACTIVE GRAPHICS, MENU SELECTION, EDUCATIONAL PROGRAMS, and just plain fun.
- Compatible with a growing library of software:
 - PC-DRAW (trademark of MICROGRAFX)
 - MICRO-CAD (trademark of COMPUTER AIDED DESIGN)
 - SARGON 3.0 (trademark of HAYDEN PUBLISHING)
 - and much much more. (Complete list on request).
- Very high performance and reliability for just \$195.00. (Optional three diskette software package is just \$39.00)
- Ultra-deluxe version soon available (\$295.00).
- Got another pen?? Ask about our trade-in special.



FTG
DATA SYSTEMS

FTG will soon become PC INNOVATIONS

10801 Dale St./P.O. Box 615
Stanton, CA 90680
(714) 995-3900

CIRCLE 250 ON READER SERVICE CARD

BASIC C LIBRARY — BRIDGING THE BASIC GAP—

Every day, programmers like yourself are making the jump from BASIC to C. With high level functions that work like BASIC and documentation that is written from the perspective of a BASIC programmer, the BASIC_C library provides the best path to help make your journey pleasant and fast!

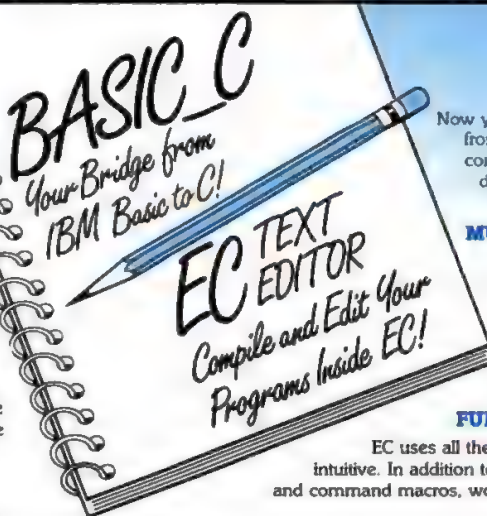
BASIC'S POWERFUL FUNCTIONS IN C PROGRAMS—

The BASIC_C library provides most of BASIC's high level functions—string handling, sequential and random i/o, graphics and many more—all are designed to look and work like BASIC functions. Instead of wasting time trying to figure out how to clear a screen or locate the cursor, you can concentrate on learning what C is about. Source code for the whole library is included!

WRITTEN WITH BASIC PROGRAMMERS IN MIND—

Our documentation is oriented to those familiar with BASIC. A full chapter is devoted to a point-by-point comparison of BASIC and C. Each function's description contains at least one example written in BASIC and the equivalent C. Many customers tell us that the BASIC_C documentation is the best C tutorial they've seen.

EC DEMO DISK -	\$ 5
EC (pronounced e-see) - full screen editor	\$125
BASIC_C LIBRARY - including source code	\$175
BASIC_C & EC	\$275
BASIC_C & DeSmet C compiler/w debugger	\$325
BASIC_C & Computer Innovations C compiler	\$475
BASIC_C & Lattice C compiler	\$525
BASIC_C & EC & DeSmet C compiler/w debugger ..	\$425
BASIC_C & EC & Computer Innovations C compiler	\$575
BASIC_C & EC & Lattice C compiler	\$625



EC SCREEN EDITOR — MAKE ANY PC-DOS CALL FROM INSIDE EC—

Now you can edit, compile and test your program from inside the EC editor. In fact, EC gives you complete access to the operating system. Do a directory, copy or delete files, even run other programs without ever leaving EC!

MULTIPLE WINDOWS ... WITH A FILE IN EACH—

All windows can be shown on the screen at the same time; or the screen can be dedicated to one file, while the others are kept in the background—only a keystroke away. You can even cut and paste blocks of text between windows!

FULL SCREEN EDITOR FOR THE IBM—

EC uses all the PC's special keys so that editing is fast and intuitive. In addition to standard editing features, EC provides text and command macros, word wrap, paragraph reformatting, horizontal scrolling, and color video control.

DEMO DISK IS ONLY \$5—

Call or write for our full-featured demo. You'll get a standard version of EC that can handle up to 10K worth of text files and a complete set of documentation. See for yourself how pleasant it is to use an editor that gives you multiple windows and free access to your operating system.

*BASIC_C and EC run on an IBM PC, or look-alike, with at least 128K RAM under DOS 1.1 or higher. To use the EC EDITOR'S DOS interface feature you must have DOS 2.0 or higher and enough RAM to run the additional program.

IBM is a trademark of International Business Machines.
MO. Residents Add 6% Sales Tax.



C SOURCE
12801 Frost Road
Kansas City, MO 64138
816-353-8808

CIRCLE 371 ON READER SERVICE CARD



If you're not getting sharp, clear images on your PC, don't give up. Persyst.

Get high resolution text on a color monitor with BoB.™

Now you can throw away your magnifying glass, because Persyst has a better way to clear up fuzzy images and all the mistakes they can cause on a high resolution monitor.

With the Persyst BoB Display Adapter you can combine high resolution text with all IBM color graphics software on a color monitor. BoB delivers its high resolution by using almost twice as many dots as other boards to form characters.

And, because BoB has total IBM color graphics software compatibility, it opens the door to a massive amount of standard software. Now you no longer have to decide between monochrome adapters that can't give you

graphics and color adapters that sacrifice text resolution. With BoB you can have it all!

Get full IBM color graphics software compatibility on a monochrome monitor.

BoB is the perfect low cost method of running graphics that don't require color. Because BoB has the ability to run *all* IBM color graphics software on a high resolution monochrome monitor. And BoB uses the entire display area, so your graphics will be full-sized. **Customize BoB to your specific application.**

BoB lets you design and download up to 256 custom characters. In any combination of language, scientific notation or graphic sets. So you can tailor character sets to your specific needs. Super sharp graphics for special

applications are also routine because BoB supports a 640 x 400 high resolution mode.

The Persyst BoB Display Adapter is a product of Emulex Corporation, an industry leader in the development of high performance controllers, communications products and packaged subsystems for PCs, micro, mini and super minicomputers.

See your computer dealer for a BoB demonstration, or write or call us today for more information. Persyst Products, 3545 Harbor Boulevard, P.O. Box 6725, Costa Mesa, CA 92626. Tel. (714) 662-5600.



Get yourself a

This little critter comes with specially-designed software that flies through the maze of keystrokes on the most popular business programs faster than you can say "cheese."

Microsoft® Mouse puts the power to run Multiplan®, Lotus 1-2-3™, VisiCalc® and WordStar® in the palm of your hand. Click the left button on the mouse, a custom menu appears. In English, not hieroglyphics. Click the right button and execute your

command: move text or data, edit, format, print. All at blinding speed without touching the keyboard.

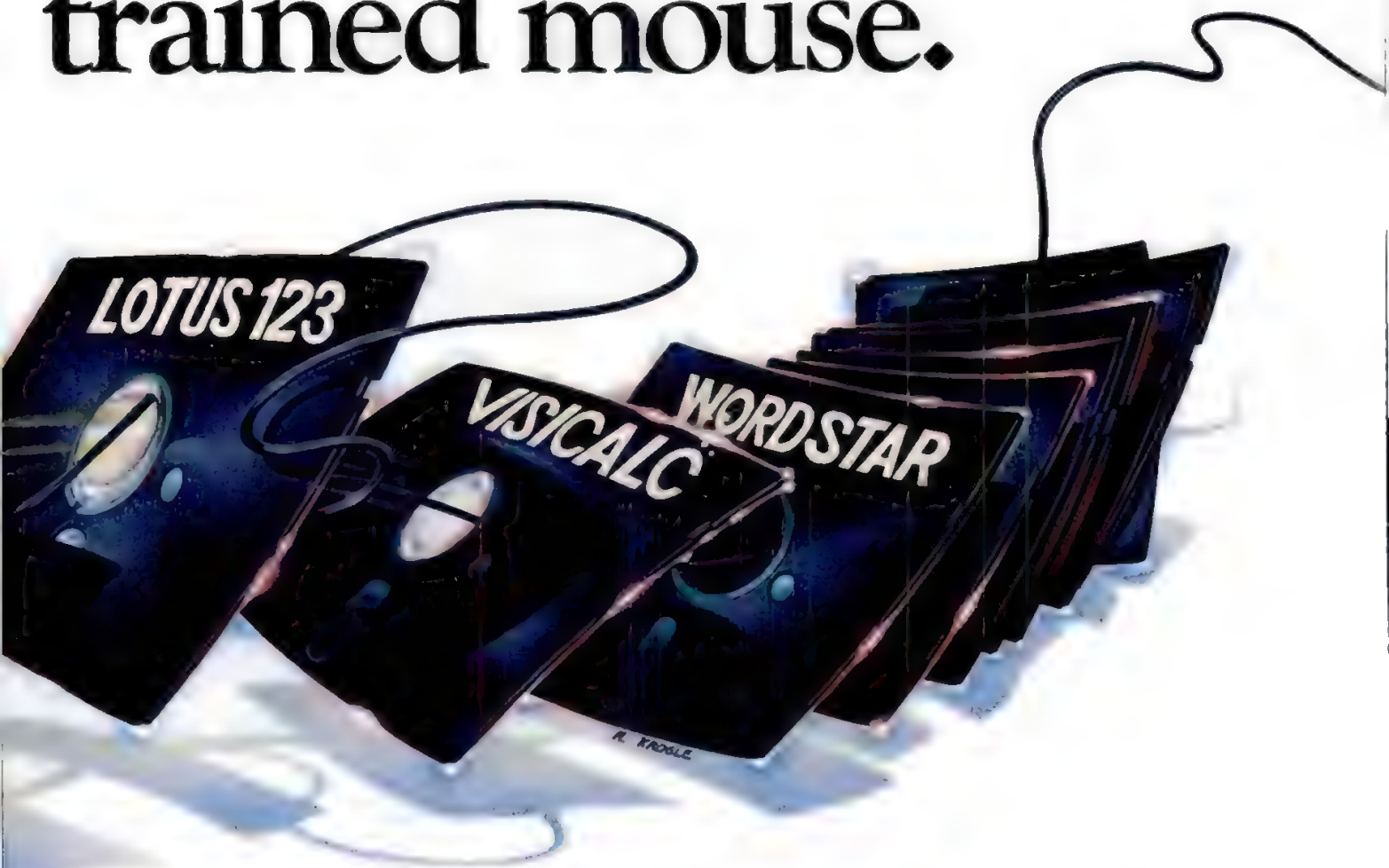
It also lets you create your own menus for editing and formatting existing application programs. So people can learn programs quicker and do more productive work as they learn.

The mightiest mouse.

Microsoft Mouse runs circles around other mice. It is the high performance mouse for the IBM® PC and PC XT. From the company known for high



trained mouse.



performance software. Microsoft BASIC is the language spoken by nine out of ten microcomputers worldwide.

MICROSOFT. Our MS™ DOS operating system tells
The High Performance Software your IBM PC how to think.

So don't monkey around with any other mouse. Call 800-426-9400 (in Washington State call 206-828-8088) for the name of your nearest Microsoft dealer. Then go with Microsoft Mouse. The mouse that soars.

MICROSOFT

Microsoft and Multiplan are registered trademarks and MS is a trademark of Microsoft Corporation.
Lotus 1-2-3 is a trademark of Lotus Development Corporation. VisiCalc
is a registered trademark of VisiCorp. WordStar is a registered trademark of MicroPro.
IBM is a registered trademark of International Business Machines Corporation.

Normal Vision...



or SuperVision.



Expand your IBM PC/XT to 132 columns. Only \$499.

"For most word processing and spreadsheet applications SuperVision is clearly the best of the... products reviewed."

— Jonathan Sachs, PC World May 1984

If you have Lotus 1-2-3, dBase II, WordStar, MultiPlan, or other popular software, this is the hardware, and in some cases the **only** hardware, that can expand your vision to 132 high-resolution columns, plus DEC VT or IBM 3278-O5 **terminal emulation**.

Simply slip the SuperVision adaptor board into one of your PC/XT's expansion slots. (It's Hercules compatible, and graphics capabilities are added with an optional clip-on attachment.) Four modes are keyboard-

selected: 80 × 25 (normal), 80 × 44 (full letter onscreen, no scrolling), 132 × 44 (spread sheet), or 132 × 28 (terminal emulation).

Why settle for tunnel vision when SuperVision extends your horizons wider than any adaptor board previously designed for the IBM PC/XT.

And further expand your IBM PC/XT useability with our color/monochrome graphic board at \$245 and the new Telephone Interface board for direct touch-tone input to the IBM PC/XT. For details call the original manufacturer: **California Computer Systems, (408) 734-5811**. Dealer inquiries invited.

SuperVision is a trademark of CCS, Inc. IBM PC/XT are registered trademarks of International Business Machines.

CIRCLE 147 ON READER SERVICE CARD



California Computer Systems
250 Caribbean Dr., Sunnyvale, CA 94089
(408) 734-5811 Telex: 171959 CCS SUVL

SPF/PC™

ACTUALLY, there is no comparison. SPF/PC is the best full-screen editor available for the IBM Personal Computer.

It looks and works like IBM's large system SPF editor.

- SPF/PC can use up to 786K of memory as workspace.
- Word processing commands.
- 4-way scrolling.
- Split screen support.
- On-line help facility.
- Can edit up to 240 character records.
- Monochrome or color supported.
- Instantaneous screen display.
- Block Move/Copy/Repeat/Delete/Overlay/Shift/Exclude
- Automatic line numbering supported.
- 40 user-definable Program Function Keys.
- Direct interface to DOS commands for PC DOS 2.0 users
- Browse sub-system
- Move/Copy sub-system copies any file format.
- Utilities include: Rename/Delete/Print/Directory list.

AND MUCH MORE . . .

UPLOAD/DOWNLOAD sub-system available to SPF/PC users for \$50.00.

\$149.95 SPF/PC requires 128K, PC DOS, and 1 disk drive.

THE ODD-COUPLE™

Allows the APPLE and IBM/PC to communicate with each other.

- Connect APPLE to PC, APPLE to APPLE, and PC to PC.
- Transfer any file in either direction.
- CHAT mode allows direct communications through the keyboard.
- An Equipment Profile allows description of your operating environment.
- Communicate Direct or through a Modem at speeds up to 9600 baud (bps).
- Written entirely in machine language for speed and efficiency.

REQUIREMENTS:

APPLE — 48K, 1 disk drive, Serial Interface

IBM — 64K, 1 disk drive, Serial Interface

\$79.95

For orders and dealer information write or call Command Technology Corp. 1900 Mountain Blvd., Oakland, Ca. 94611, (415) 339-3530. Mastercard/Visa, Check, or P.O. accepted. Add \$5.00 for shipping. Canada \$10.00. Foreign \$15.00.

IBM is a registered trademark of International Business Machines Inc. APPLE is a registered trademark of Apple Computer Inc.

CIRCLE 182 ON READER SERVICE CARD

telasoft

CALL
TOLL
FREE

1-800 IBM ONLY

Order Line: 1-800-426-6659 • Order Processing & Other Information: 602-224-9345 • Order Line Hours: Mon-Fri 8:30 - 5:30 Saturday 9-1
Address: 1943 East Indian School Road • Suite 194 • Phoenix, Arizona 85016



SOFTWARE SPECIALS

FRAMEWORK	\$365	SYMPHONY	\$419
dBASE III	\$365	LOTUS 1 2 3	\$299
UPGRADE TO dBASE III	\$129	SUPERCALC 3	\$165
UPGRADE TO SYMPHONY	\$139	VOLKSWRITER DELUXE	\$155

WORD PROCESSORS

Bank Street Writer	\$ 48
Multimate	259
PFS Write	79
PFS Proof	55
The Word	225
The Word w/Mouse	285
Word Perfect	229
Word Plus Spell Checker	90
Wordstar w/ Tutor	199
Wordstar Pro Pack	275
Wordstar Pro Option	155

UTILITIES

Copy II PC	\$ 25
Desk Organizer	185
Fancy Fonts	135
Norton Utilities	48
Prokey 3.0	79
Sidelock	35
Sideways	35
Turbo Pascal	35

ATI for IBM	\$ 45
CDEX for IBM	43
Flight Simulator (New Version)	32
Speed Reader II	40
MasterType	30
Typing Instructor	35
Typing Tutor III	30

MONEY MANAGEMENT

Dollars & Sense	\$ 96
Home Accountant Plus	85
Tabias's Managing Your Money	115

COMMUNICATIONS

CompuServe Starter Kit	\$ 25
Crosstalk XVI	99
Move-It	70
PFS Access	55
Smartcom II	85

Multiplan	\$119
PFS Graph	79
PFS Report	71

Harvard Project Manager	\$229
Project	155

INTEGRATIVE SOFTWARE

Electric Desk	\$195
---------------	-------

BPI General Accounting	\$369
BPI Accounts Payable	369
BPI Accounts Receivable	369
BPI Payroll	369

DATA MANAGEMENT

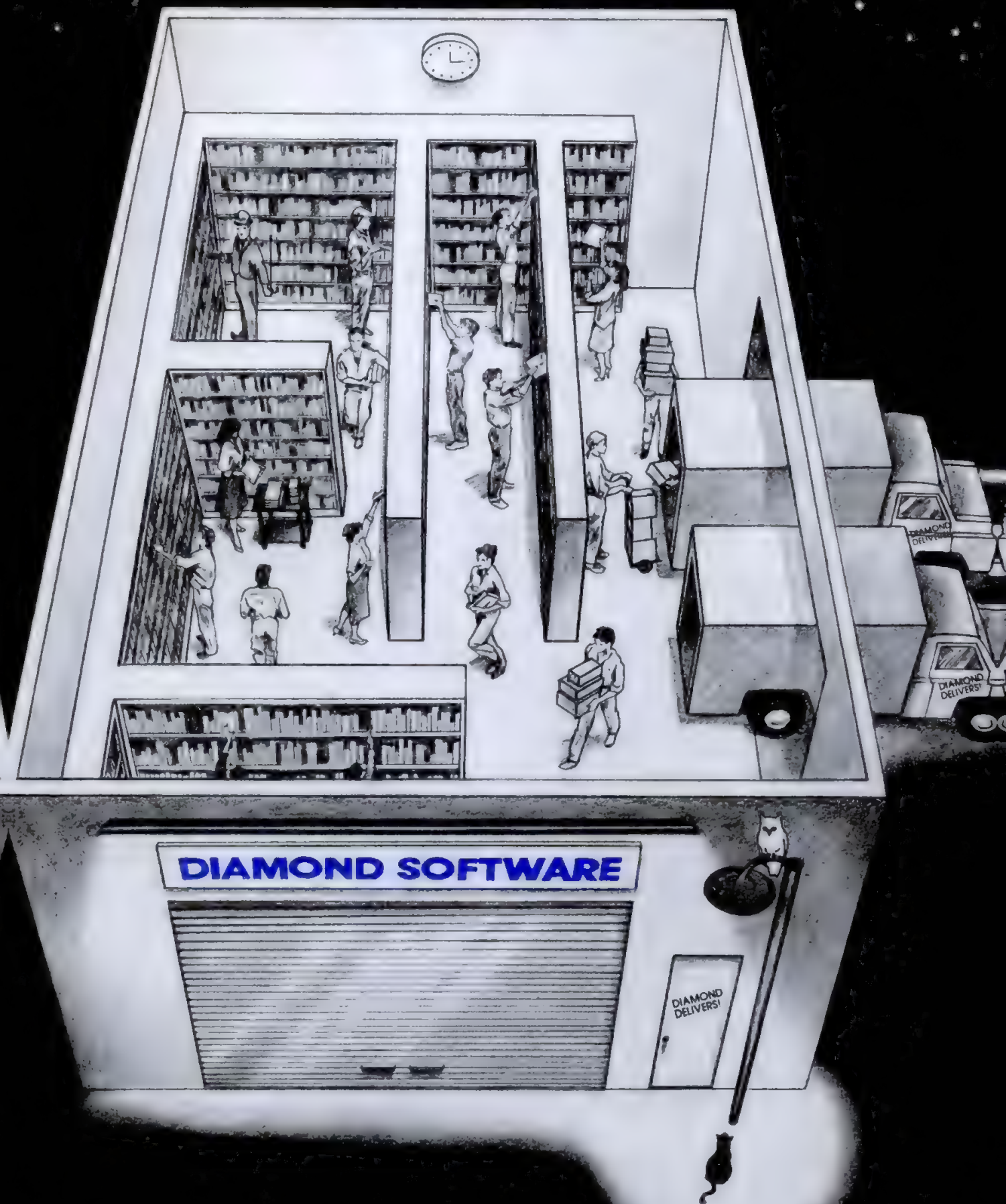
Advanced DB Master	\$357
dBase Manager II	159
Friday	145
Knowledgeman	275
PFS File	79
Power-Base	245
Quickcode III	149
R Base 4000	269
R Base Clout	115
R Base Extended Report Writer	85
Think Tank	105
Versaform (PC & XT)	235

For Your Macintosh Software Needs call:
1-800-MAC-ONLY

Call for FREE subscription to the Software Advisor Newsletter

CIRCLE 204 ON READER SERVICE CARD

WHEN YOU'RE #1 YOU HAVE TO



WORK EVEN HARDER TO STAY THERE

DIAMOND DELIVERS!

The Total Solution
Full Service • Full Support
Low, Low Prices

This Month's Packaged Specials

Wordstar Pro Pack/ Lotus 123	\$559	Multimate/Symphony	\$709
Wordstar Pro Pack/ Lotus 123/dBase III	\$959	AST 6 Pack 384K/ Symphony	\$959
Hayes 1200/Crosstalk	\$589	Wordstar Pro Pack Plus w/ Telmerge/Mailing List	\$369
Wordstar/Mailmerge/ Correctstar/Star Index	\$269	Easywriter II/Speller II/ Mailer II	\$195

dBase III Volkswriter Dlx Framework

Alpha Software*	\$ call
APPLE-IBM CONNECTION	\$179
DATA BASE MANAGER II	\$ call
ELECTRIC DESK	\$179
Ashton-Tate*	
QBASE II	\$299
FRIDAY	\$159
Condor*	
CONDOR 3	\$319
Microware*	
CROSSTALK XVI	\$105
Digital Research*	
PASCAL MY 86	\$249
CONCURRENT PC DOS	\$ call
CONCURRENT CP/M 86	\$229
C BASIC 86	\$135
PERSONAL BASIC	\$109
CP/M 86	\$39
ACCESS MGR	\$249
DISPLAY MGR	\$329
DR LOGO	\$69
PC DOS LANGUAGES	\$ call
Desk Lines*	
MARKET ANALYZER	\$239
MARKET MANAGER	\$209
Financial*	
FINANCIAL II	\$119
TAX SERIES	\$109
Font & Font*	
QUICKCODE	\$179
GRAPH	\$179
OUTL	\$59
GMS Systems*	
POWERBASE	\$395

Wordstar Lotus 123 Multimate

Harvard Software*	\$199
HARVARD PROJECT MANAGER	\$ call
Information Unlimited*	\$289
EASYSPELLER II	\$395
EASYMAILER	\$279
GENERAL LEDGER	\$130
ACCOUNTS PAYABLE	\$59
ACCOUNTS RECEIVABLE	\$59
INVENTORY CONTROL	\$ call
PAYROLL	\$ call
Lattice*	
LATTICE C COMPILER	\$319
PANEL	\$219
HALO	\$125
Micro Data Base*	
KNOWLEDGEMAN	\$319
Meridian*	
MAILMERGE	\$129
CORRECTSTAR	\$99
PLANSTAR	\$309
STARBURST	\$99
SUPERSORT II	\$99
INFOSORT/STARBURST	\$299
TELMEGE	\$89
CHARTSTAR	\$209
PRO OPTION PACK	\$179
Meridian*	
MOUSE	\$139
WORD/MAILMERGE	\$249
WORD W/MOUSE	\$209
MULTITOOL FINANCIAL	\$69
MULTITOOL BUDGET	\$99
PASCAL COMPILER	\$209
FORTRAN	\$339
C COMPILER	\$169
CHART	\$169
PROJECT	\$169

R:Base 4000 Multiplan Symphony

Microsoft*	\$309
DOLLARS & SENSE	\$129
Proforma Symphony*	\$ call
WORD PLUS W/BOSS	\$109
Microsoft*	
CLOUT	\$109
EXTENDED REPORT WRITER	\$89
Microsoft*	
PROKEY	\$85
Software Publishing*	
PFS REPORT	\$140
PFS FILE	\$95
PFS GRAPH	\$140
PFS WRITE	\$95
Parsons*	
SUPERCALC 3	\$395
SUPERWRITER	\$219
Warren, Gorham & Lamont*	
WARNER DESK ORGANIZER	\$395
Ziff-Davis*	
6 PAK PLUS-64K	\$269
ALL OTHER AST PRODUCTS	\$ call
IBM*	
SMARTMODEM 1200	\$489
SMARTMODEM 1200B	\$419
IBM*	
QUADLINK	\$479
QUADCOLOR I	\$209
QUADCOLOR II	\$209
64K EXPANDABLE BOARD	\$409
QUADBOARD EXP. TO 384K	\$269
IBM*	
GRAPHICS CARD	\$349
COLOR CARD	\$175
IBM*	
MEMORY CHIPS (64K)	\$55

TO ORDER
CALL TOLL-FREE
1-800-227-0545
Software Specialists
For The IBM PC



Diamond Software Supply

484 Lake Park Ave. Suite 123 Oakland CA 94610

For price quotes, information or in California call 1-415-893-7676. We credit your order for the call. **Technical Department** (415) 893-7678 International Telex 338139 (attn 149)
IBM is a trademark of International Business Machines CPM is a trademark of Digital Research Apple is a trademark of Apple Computer Inc.

CIRCLE 307 ON READER SERVICE CARD

- Special Corporate Incentives
- Cumulative/Quantity Discounts
- Same Day Shipment
- Overnight Delivery Available
- Purchase Orders Accepted From Qualified Organizations
- IBM, CPM, Apple formats
- Expert Technical Assistance
- Full Product Guarantees
- Visa, M/C, Amer. Exp.
- Free UPS Surface w/Ppd Check

How to save money and time.

Here's
How

Here's
Why

By shopping by mail with Conroy-LaPointe you can now afford to go the full 640K RAM memory for your PC or get more software with what you save. A phone order only takes about ten minutes, all from the comfort of your home or office.

1. **SAVE** an average of 21% to 46%. (Our average profit over 6 years has been less than 4%.)
2. **FAST QUALITY SERVICE** from our professional and courteous staff and our **LARGE INVENTORY** will save you time and make shopping easy for you.
3. **QUALITY IN-STOCK PRODUCTS** means that we only sell products from reliable and reputable manufacturers. Our return policy guarantees that you won't get somebody else's rejects.

OUR AD
#P10

MEMBER
DIRECT
MARKETING ASSOCIATION



DEALERS
WE BUY
EXCESS
INVENTORIES

© 1984 by Conroy-LaPointe, Inc. All Rights Reserved

PRINTERS AND ACCESSORIES			
DOT MATRIX:	LIST PRICE	OUR PRICE	
EPSON LQ1500, 700 & 67 CPS	NEW \$ 1,395	Call	
Parallel Interface for LQ1500	NEW \$ 100	Call	
RX80, 100 cps	\$ 399	Call	
RX80, F/T	\$ 499	Call	
FX80, 160 cps	\$ 699	Call	
FX100, 160 cps	\$ 895	Call	
Apple II Graphics Dump Program	\$ 15	\$ 9	
•MANNESMANN Spirit, 80 col 80cps	\$ 399	\$ 299	
TALLY, 180L, 80 col, 160cps	\$ 798	\$ 568	
180L, 130col, 160cps	\$ 1098	\$ 778	
OKIDATA, 82A, 80 col, 120 cps, para.	\$ 349	\$ 319	
83A, 132 col, 120 cps, para.	\$ 749	\$ 599	
84, 136 col, 200 cps, para.	\$ 1395	\$ 1095	
92, 80 col, 160 cps, para.	\$ 599	\$ 469	
93, 136 col, 160 cps, para.	\$ 999	\$ 695	
2350P Pacemark, 350cps, para.	\$ 2695	\$ 2095	
2410P Pacemark, 350cps, para.	\$ 2995	\$ 2395	
Accessories, Plug 'N Play, Tractors, Olograph		Call	
ORANGE MICRO, Grappler+, for Apple	\$ 165	\$ 119	
PRACTICAL, Microbuff In-Line 64K, Para.	\$ 349	\$ 259	
Microbuff In-Line 64K, Ser	\$ 349	\$ 259	
QUADRAM, Quadjet, Jet Color Printer	\$ 695	\$ 795	
•STAR MIC, Gemini 107X, 120cps	\$ 495	\$ 285	
Gemini 157X, 120cps	\$ 549	\$ 439	
TOSHIBA, 135, 100 cps	\$ 1195	\$ 1495	
LETTER QUALITY:			
AMDEK, 5040, 40 cps, Para. & Ser	\$ 1675	\$ 1395	
•TTX, 1014, 13cps, Para. & Ser, Pen & Inc. 3p.	\$ 499	\$ 365	
1114, same as 1014 with T/F, 2 col./4pp.	\$ 599	\$ 439	
NACover, Interface TTX to Apple MAC		Call	
•JUNO, 6100, 18cps, Para, 3 pch	\$ 599	\$ 459	
PRINTER INTERFACES and BUFFERS:			
IBM-PC Parallel Printer Cable	\$ 60	\$ 35	
Apple II I/F & Cable for Epson or Gemini	\$ 95	\$ 59	
QUADRAM, All expandable to Acopy to 512K (Snap-on to 64K)			
Microtizer, Snap-on & w/Copy	IN STOCK	Call	

MODEMS AND ACCESSORIES			
	LIST PRICE	OUR PRICE	
ANCHOR, Signamax Mark XII	\$ 399	\$ 299	
HAYES, IBM-PC Smartmodem 1200B	\$ 599	\$ 419	
IBM-PC Smartcom II Software	\$ 149	\$ 109	
Microcomem Iie w/Smartcom	\$ 329	\$ 239	
Microcomem 100 (S-100 bus)	\$ 399	\$ 275	
Stack Chronograph (RS-232)	\$ 249	\$ 189	
Stack Smartmodem 300/RS-232	\$ 289	\$ 225	
Smartmodem 1200 (RS-232)	\$ 699	\$ 535	
IBM-PC to Modem Cable	\$ 39	\$ 29	
KENSINGTON, Modem 1200	NEW	\$ 585	\$ 385
NOVATION, 103/212 Smart Cat	\$ 595	\$ 415	
ACCESS 1-2-3 (1200B) •Crosstalk XVI	\$ 595	\$ 399	
Apple Cat II 300 BAUD	\$ 389	\$ 249	

MONITORS AND ACCESSORIES			
	LIST PRICE	OUR PRICE	
• 12" Green, #300C	\$ 179	\$ 119	
• 12" Amber, #300A	\$ 199	\$ 149	
• 12" Amber, #310A for IBM-PC	\$ 230	\$ 159	
• 13" Color I+, Composite	\$ 399	\$ 249	
• 13" Color II, RGB, H Res, (IBM/Apple)	\$ 559	\$ 439	
• 13" Color IV, RGB, 720Hx400V (IBM)	\$ 795	\$ 685	
DVM III, Color II or III to Apple II I/F	\$ 179	\$ 129	
• PRINCETON, RGB 1/2 Res, HX-12	\$ 795	\$ 499	
• RGB H Res, SR-12	\$ 799	\$ 599	
• Amber, MAX 12 (for Mono Board)	\$ 249	\$ 199	
• QUADRAM, Quadchrome 12" RGB Color	\$ 695	\$ 495	
• Quadscreen 17" 96Hx512	\$ 1995	\$ 1595	
• Quadchrome II, 14" RGB Color	NEW	\$ 650	\$ 450
• Amberchrome, 12" Amber	NEW	\$ 250	\$ 165
ZENITH, 12" Green, ZVM123	\$ 200	\$ 89	
12" Amber, ZVM124	\$ 200	\$ 149	
12" Color, ZVM135	\$ 599	\$ 499	

DISKETTES			
• CONROY-LAPOINTE™ DISKETTES NEW!			
We guarantee these top quality products with the Conroy-LaPointe name. 3 YEAR LIMITED WARRANTY.			
10 ea. SS/SD, 35 Track (Apple, etc.)		\$ 17	
100 ea. SS/SD, 35 Track (Apple, etc.)		\$ 149	
1000 ea. SS/SD, 35 Track (Apple, etc.)		\$ 1245	
10 ea. DS/DD, 40 Track (IBM, H/P)		\$ 29	
100 ea. DS/DD, 40 Track (IBM, H/P)		\$ 239	
1000 ea. DS/DD, 40 Track (IBM, H/P)		\$ 1995	
10 ea. DS/DD, 40 Track (IBM-PC Pre-formatted) NEW		\$ 34	
100 ea. DS/DD, 40 Track (IBM-PC Pre-formatted) NEW		\$ 289	
1000 ea. DS/DD, 40 Track (IBM-PC Pre-formatted) NEW		\$ 2495	
AMDEK, 3" Diskettes, Pac-10		\$ 60	\$ 49
CDC, 100 ea SS/DD, 40T (Apple, IBM)		\$ 550	\$ 195
10 ea SS/DD, 40T (Apple, IBM)		\$ 55	\$ 21
100 ea DS/DD, 40T (IBM, H/P)		\$ 750	\$ 295
10 ea DS/DD, 40T (IBM, H/P)		\$ 75	\$ 32
DYSAN, 10 ea SS/DD (Apple, etc.)		\$ 40	\$ 27
(10 ea DS/DD 48T (IBM H/P/mtc))		\$ 69	\$ 35
MAXELL, 10 each, MD1, SS/DD		\$ 55	\$ 19
10 each, MD2, DS/DD		\$ 75	\$ 28
VERBATIM, 10 each, MD515-D1, SS/DD		\$ 49	\$ 27
10 each, MD34, DS/DD		\$ 84	\$ 32
GENERIK™ DISKETTES			
100 ea. SS/SD, 35 Track (Apple, Atari)		\$ 415	\$ 99
1000 ea. SS/SD, 35 Track (Apple, Atari)		\$ 4150	\$ 950
100 ea. DS/DD, 48TPI (IBM, H/P)		\$ 626	\$ 119
1000 ea. DS/DD, 48TPI (IBM, H/P)		\$ 6260	\$ 995

CASH & CARRY OUTLETS:

Over the counter, cash only. Open Monday through Saturday, 9:00 to 6:00.
SAN FRANCISCO — NEW STORE OPENING 9/84. For information, call (415) 561-9050. **PORTLAND, OREGON —** At Para 217, Igard at intersection of 217 and 99A. Call 620-5595.
SEATTLE, WASH — 3540 128th Ave SE, Bellevue WA 98006. In Coenmann's Plaza near Factoria Square SE of Hwy 405 & 90 and at SE 36th & Richards. Call 641-4736.

CONROY-LA POINTE

TOLL FREE

(800) 547-1289

LOW PRICES TO PROFESSIONALS WHO KNOW WHAT THEY WANT AND KNOW HOW TO USE IT!

ALL MAIL: Conroy-LaPointe, Inc. 12060 SW Garden Place, Portland, OR 97223

SHOWROOMS AT: PORTLAND, OR AND SEATTLE, WA — BOTH OPEN M-SAT 10-6

SYSTEMS

— Call for Details —

256K IBM - PC or XT

360K
Disk Drives
by CDC
90 Day
Limited Warranty
By Us

COMPAQ Portable, 256K, 2 360K Disk Drives

LIST PRICE \$2495

OUR CALL

SANYO 555-2, 256K, 2 320K Disk Drives

LIST PRICE \$1499

CALL

TeleVideo PC, 256K, 2 360K Disk Drives, 8088 Chip

LIST PRICE \$1499

CALL

Z1150, 256K, 2 320K Disk Drives, MS DOS 2.1, 8088 Chip, 2 S/P

LIST PRICE \$2799

CALL

SUPPLY CENTER for IBM-PC or XT

AMDEK
AST

MAI 4-in 1 Multiple Color, Graphics & Mono, Para Port	\$499	\$399
Compo Products	Call	Call
MegaPlus Products	Call	Call
SuperPlus 64K/S/P/CC+S/W	\$395	\$285
SuperPlus 256K/S/P/CC+S/W	\$50	\$39
SuperPlus 384K/S/P/CC+S/W	\$895	\$595
Game Port for SuperPlus	\$50	\$39
I/O Plus II, S/P/CC/G	\$215	\$150
I/O Plus II, S/P/CC/G	\$265	\$185
I/O Plus II, S/P/CC/G	\$315	\$215
MegaGraphPlus P/CC/for Lotus	\$495	\$375
PCNet, Starter Kit, PC002	\$1095	
PCNet, Circuit Board, PC001	\$495	
SuperVision, 132 col, mono board	\$799	\$399
Graphics Adapter for Supervision	\$250	\$99
Power Pad Requires Kit	\$100	\$73
Chalkboard Starter Kit	\$50	\$34

CCS
Chalkboard
ComX

EconoRAM™ 256K RAM Card w/ FastRAM disk emulator and spooler software	\$495	\$325
UNI-Monitor III & swivel base	\$50	\$39
3 to 9 foot keyboard cable	\$40	\$30
Vertical CPU "System Stand"	\$25	\$19
Monochrome Ext. Cable Pair	\$50	\$35
8087 Chip	NEW	\$175
8087 Math Pak	NEW	\$295
8087 Software Pak	NEW	\$180
8087 Macro Pak	NEW	\$245
Color Card w/para	\$245	\$169
Graphics Card, Mono	\$245	\$169
KB5150, Std. keyboard	\$209	\$159
KB5151, Std. keyboard	\$209	\$159
KB5151, Keyboard	NEW	\$255
Koala Pad™ w/PC Design	\$150	\$99
Programmer's Guide	\$15	\$14
MultiFunction (MFC) Card, MFC	\$89	\$79
Memory Card no RAM	\$199	\$109
Memory Card 256K	\$495	\$395
HardDisk I/F Module (HDM)	\$499	\$399
HardDisk Cable	\$30	\$27
Para Port Module (PPM)	\$59	\$49
Serial Port Module (SPM)	\$95	\$79
Clock Card Module (CCM)	\$55	\$48
Game Adapter Module (GAM)	\$49	\$43
Memory Module 17K (MMO)	\$122	\$99
Memory Module 256K (MM256)	\$422	\$357

HAUPPAGE
(HCW)HERCULES
Key TronicKoala
MAYNARD
SANDSTAR
SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

Koala

MAYNARD

SANDSTAR

SERIES

Key Tronic

The greatest, the quickest and the latest

HARDWARE

AST RESEARCH
AST 6-PACK PLUS multi-function board. 64K-384K expandable memory, clock calendar, 1 serial and 1 parallel port, includes Super Drive and Super Spool software (optional game port adapter available). 6-Pack Plus 64K **269.95**
For game port option add 34.95
 64K RAM set (consists of 9 pieces) upgrades memory by 64K **59.95**
**10.00 installation fee (per 64K) with purchase of memory board at time of board purchase only.*

CDC DS/DD disk drive **199.95**

CURTIS
PC-II Pedestal for IBM monochrome display **New Low Price** **39.95**
AD-1 Adapter for use of PC-I with Princeton or Quadrome color monitor **7.95**
UNI/1 Universal tilt and swivel base for use with monitor **36.95**
EC-I 3' monochrome extension cable **36.95**
EC-II 3'-9" coiled keyboard extension cable **27.95**
8087 Math coprocessor with diagnostics **174.95**

DCA INC.
Irma Board 3278 Emulation .. **974.50**

IQ TECHNOLOGY
Smart Cable (RS-232C) **79.95**
Eliminates RS-232C cable compatibility problems. Please specify male or female to computer.

KEYTRONICS
New! KB-5151 keyboard **189.95**

MICROSOFT
New! Mouse with software .. **129.95**

MOUSE SYSTEMS
Mouse w/pop-up menus Design your own menus for most programs software included (req. RS-232C port) .. **169.95**

PERSYST
Memory expansion card 64K-384K, Parallel and Serial ports, Clock/Calendar and software w/64K **259.95**

QUADRAM QUADBOARD
New! Expanded Quadboard, expandable from 64K to 384K, 1 parallel 1 serial and game port I/O bracket and quadmaster software **64K** **264.95** **384K** **569.95**

STB
RIO PLUS Multi function board 64K-384K exp. memory, 1 serial 1 parallel and game port (game port cable included) clock calendar and PC Accelerator software. **Rio Plus 64K** **254.95**

TEAC
Half Height DS/DD Disk Drive **159.95**
CDC DS/DD Disk Drive **199.95**

TECMAR
CAPTAIN multifunction memory board expandable from 64K to 384K. **64K** **259.95** **256K** **399.95**

HARD DISK DRIVES

ALLOY
Cartridge back-up system for PC/XT & compatibles. 16.5 MB per single cart. *Interface card included* ... **1749.00**

ALLOY PC STOR
New! PC-STOR Hard disk drive sub-system w/cartridge tape backup
20 MB (16 FMT.) Call **52 MB (41 FMT.)** Call
40 MB (32 FMT.) Call **85 MB (67 FMT.)** Call

DATAMAC TRUSTOR
10 mega byte external hard disk drive with cabinet and power supply for IBM-PC. *Interface card and controller included* **999.95**

IOmega BERNOULLI BOX
10 MB bernoulli box **2295.00**
20 MB (2-10 MB in cabinet) **2995.00**
10 MB cartridge **69.95**

TALLGRASS
Hard drive sub system with backup
TG-3020 20 MB w/backup .. **3195.00**
DC-600 Data cartridge **34.95**

DISPLAY CARDS

AST Monograph Plus parallel/serial and clock calendar, Lotus 1-2-3 graphics compatible **399.95**
HERCULES Color Card **179.95**
Graphics Card (Monochrome) **339.95**
New! PARADISE Modular Graphics Card **294.95**
64K RAM board with clock for Paradise **209.95**
Parallel port for Paradise ... **79.95**
PLANTRONICS Color Plus .. **324.95**
STB Graphix Plus II (Color and Monochrome) ... **359.95**
TSENG Ultrapak Monochrome card, 132 column with Lotus and graphics **499.00**

MODEMS

HAYES
Smartmodem 300 **199.95**
Smartmodem 1200 RS-232 .. **479.95**
Smartmodem 1200B Internal with Smartcom II **419.95**

VEN-TEL
PC Half Modem-Internal 300/1200 modem fits in short slot of XT or PC portable w/Crosstalk XVI **429.95**
1200 Plus-External 300/1200 **379.95**
(Requires RS-232 Card and Cable)
1200 Baud, Internal Auto Dial/Answer **259.95**

MONITORS

AMDEK and PANASONIC Monitors
Call for Low Prices

PRINCETON
HX-12 Hi-res RGB Color **489.95**
MAX-12 Monochrome (to use with Monochrome Card) Amber **169.95**
TAXAN
420-12"-super hi-res RGB color **429.95**
122-12"- Amber for PC (requires monochrome card) **144.95**
121-12"-green for PC (requires monochrome card) **154.95**

PRINTERS

BROTHER
HR-15 13 CPS **399.00**
HR-25 23 CPS **649.00**
HR-35 36 CPS **899.00**
Tractor Feed f/HR-15 or HR-25 **124.95**
Single Sheet Feeder for HR-15 or HR-25 **219.95**

DIABLO
630 API letter quality **1499.95**
Tractor Feed **269.00**
Parallel Cable for 630 to PC .. **45.00**
Single Sheet Feeder for 630 **479.95**

EPSON
RX-100, RX-80 F/T Call
FX-80, FX-100, LQ-1500 Call
RX-80 See Box

JUKI
6100 18 CPS Letter Quality .. **429.95**
NEC
3550 letter quality 33 CPS **1594.95**
2050 letter quality, 18 CPS **894.95**
Tractor Feed 3550/2050 **209.95**

OKIDATA
OKI-92 Call **OKI-84** Call
OKI-93 Call **OKI-82** Call

PANASONIC
KXP-1090 80 CPS F/T **269.95**
KXP-1091 120-CPS F/T **329.95**

QUANTEX
7065 Multi mode printer ... **1649.95**

QUME
SPRINT II/55 plus 55 CPS with interface **1599.00**
(Specify IBM PC parallel or standard Centronics parallel).

HARDWARE SPECIALS*

TOSHIBA P-1351 3 in 1 Printer **\$1349⁹⁵**
 192 CPS draft quality, 12 CPI, 100 CPS letter quality

HYPERION 256K portable IBM® compatible
 2-320K drives and 7" amber monitor. Free Lotus 1-2-3, Internal 300 baud modem and carry case. **\$1895⁰⁰**

EPSON RX-80 **\$269⁹⁵**
 Dot matrix printer

OLYMPIA COMPACT RO **\$369⁹⁵**
 Letter quality printer, Parallel & serial ports

ACCOUNTING

OPEN SYSTEM ACCOUNTING
 General Ledger, Acct's Receivable, Acct's Payable, Payroll, Inventory, Sales Order Proc., Team Manager **\$419⁹⁵ each**
BI-286 D (Required to run programs) **\$149⁹⁵**

IUS Accounts Receivable, Accounts Payable, General Ledger, Order Entry **\$289⁹⁵ each**
Payroll **\$349⁹⁵**

OSPREY ACCOUNTING SOFTWARE
 Accounts Receivable, Accounts Payable, General, Ledger, Inventory, Sales Invoicing **\$219⁹⁵ each**

* Prices effective through Oct. 30, 1984

SILVER REED
EXP-550 16 CPS **449.95**
EXP-770 30 CPS **879.00**
Tractor Feed for EXP-550 ... **124.95**

TEXAS INSTRUMENTS
855 with Tractor Feed **799.95**

TOSHIBA
P1351 Printer See Box
P1340 Printer **799.95**

SWEET P
6 Pen Plotter (Parallel/Serial) **879.95**

GENESIS SINGLE SHEET FEEDERS
for Juki 6100 **279.95**
for NEC 3550 **349.95**
for Diablo 630 **349.95**
for Silver Reed 550/770 **209.95**

FLOPPY DISKS

	SS/DD	DS/DD
IBM 5 1/4" (10 pk.)	32.95	32.95
MAXELL 5 1/4" (12 pk.)	21.95	29.95
FUJI 5 1/4" (10 pk.)	19.50	29.50
NASHUA 5 1/4" (10 pk.)	17.95	22.95

SOFTWARE

ALPHA
Electric Desk **229.95**
Data Base Manager II **164.95**

ASHTON TATE
Dbase II **289.50**
New! Ashton Tate DBASE III **379.95**
Ashton Tate Framework **379.95**

BEST PROGRAMS
PC/Tax Cut **154.95**
PC Professional Finance II .. **149.95**

BPS
BPS-Business Graphics (requires color card) **199.95**

BRIGHT BILL
Graphics Partner **89.95**
See box for special offer

BUSINESS SOLUTIONS
Jack-2 **269.95**

CBS SOFTWARE
Managing for Success
People Management **59.00**
Personal Development **59.00**
Micro SpeedRead **87.50**
Mastering The SAT **99.50**

COMPUTER EDI TYPE
MagicBind for word star **174.95**
(Req. Diablo, Nec or Qume compatible letter quality printer).

CONCENTRIC DATA SYSTEMS
C.I.P. Centric Information Processor **249.00**

DOW JONES
Connector **39.95**
Investment Evaluator **99.95**
Market Analyzer (req. color card) .. **239.95**
Market Manager **199.95**
Market Microscope **239.95**
Spread Sheet Link **169.95**
DAYFLO Dayflo (XT/256K) **339.95**

FOX & GELLER for DBase
Quick Code* **149.95**
Dutil* **44.50**
DGraph* **149.95**
**For DBase II or III. Please specify*
OZ (req. 256K & color card) **219.95**
RGraph (for RBase 4000) **149.00**

FUNK SOFTWARE
Sideways **44.95**

HARVARD SOFTWARE
Harvard project manager **249.95**

HARVARD ASSOC
PC Logo (req. 128K/color card) **99.95**

HAYES
"PLEASE" **229.95**

HERITAGE SOFTWARE
Smartkey II **49.95**

HUMAN EDGE
The Management Edge (128K) **165.00**
The Sales Edge (128K) **165.00**

PC products — we've got them all for less.

SOFTWARE SPECIALS*




LIVING VIDEOTEXT Think Tank (Req. 256K)	\$114⁹⁵
PRENTICE HALL ExecuVision (Req. color card)	\$259⁹⁵
GRAPHICS PARTNER with purchase of dBase II, dBase III or Framework	\$29⁹⁵
MONOGRAM/TRONIX Dollars and Sense	\$99⁹⁵
VISICORP VISIWORD PLUS	\$104⁹⁵

SYSTEMS*

MBSI (Real World) ACCOUNTING General Ledger, Acct's Payable, Acct's Receivable, Inventory Control, Order Entry/Billing, Payroll	\$399⁹⁵ each
Sales Analysis	\$249⁹⁵
STATE OF THE ART ACCOUNTING General Ledger, Accounts Receivable, Accounts Payable, Inventory, Payroll	\$429⁹⁵ each
Budget and Financial Reporting, Sales Invoicing (Requires Accounts Receivable)	\$379⁹⁵ each
Professional Time and Billing	\$594⁹⁵

KNOWARE Knoware (requires color card)	64.50
KRELL SAT	199.95
LIFE TREE Volkswriter Deluxe	169.95
LIVING VIDEOTEXT Think Tank (requires 256K) See Box	
MECA Andrew Tobias Managing Your Money (128K)	134.95
MICRO DATA BASE SYSTEMS Knowledge Man	249.95
K-Paint and K-Graph	99.00
with purchase of KnowledgeMan	
MICRO PRO INFOTAR PLUS Version 1.6	249.95
Includes Star Burst	
Wordstar Pro Pack	269.95
Wordstar 3.3	189.95
MICRORIM RBase 4000 (requires 256K)	279.95
Extended Reportwriter	96.50
Clout	119.95
MICROSOFT Chart	159.95
New! Flight Simulator	29.95
Fortran Compiler MS/DOS	229.95
Pascal Compiler	194.95
Macro Assembler	69.95
Multiplan	129.95
Word w/Mouse	279.95
MICROSTUF Crosstalk XVI	99.95
MONOGRAM Dollars & Sense	See Box
MULTIMATE Multimate Version 3.22	259.95
PBL CORP Letterform 1000 DOS 2.0	64.00
Personal Investor	124.00
PETER NORTON Norton Utilities	49.95

POWER BASE SYSTEMS Power Base	259.95
PROFESSIONAL SOFTWARE Word Plus PC with BOSS	279.00
ROSESOFT Prokey 3.0	84.00
SIMON & SCHUSTER Typing Tutor III	32.95
SOFTSTYLE SET-FX + (1/Epson FX printers)	49.95
SOFTWARE INTERNATIONAL Open Access (req. 256K color card)	379.95
SOFTTEND Aura (DOS 2.0/256K)	329.95
SOFTWARE PUBLISHING PFS File	89.95
PFS Graph	89.95
PFS Report	79.95
PFS Write	89.95
SSI Word Perfect with Speller	269.95
STATE-OF-THE-ART The Bookkeeping System	359.95
SOFTWARE ARTS TK Solver	259.95
SUMMA SOFTWARE Traders Accountant	299.95
Winning on Wall Street	
Traders Data Manager	139.95
Traders Forecaster	169.95
VISICORP VISION (Requires XT with 512K)	
Calc	229.95
Mouse	159.95
Graph	149.95
Word	219.95
Application Manager	57.95
VISICORP VisiCalc 4 w/Stretch Calc	149.95
VisiWord Plus	See Box
VisiFile Version 3.0	99.95
VM COMPUTING Relay Communication software	99.50
WARNER SOFTWARE Desk Organizer	169.95
WESTERN UNION EASY LINK Instant Mail Manager	69.95

- No surcharge for credit cards. 
- Prompt and efficient service.  
- Extensive inventory of PC products.
- Knowledgeable and experienced sales staff.

We stock an extensive inventory on IBM PC®, XT®, Apple®, Kaypro®, Compaq®, Hyperion®, AT&T®, Olivetti®, and many more.

Remember Our Name — It's all the Memory You Need.

47st. Computer

Computers and Business Equipment

A Division of 47st. Photo Inc.

Now at 3 convenient locations

67 W. 47th St. • 115 W. 45th St.
39 Ann Street Near City Hall
and the World Trade Center

Mail Order Address: 36 East 19th Street
New York, N.Y. 10003

212-260-4410

TOLL-FREE
OUT-OF-STATE 800-221-7774

CIRCLE 242 ON READER SERVICE CARD

STORE HOURS:

Sunday 10-4, Monday-Thursday 9-6, Friday 9-2

We accept MC, Visa, American Express & personal checks (no delays if approved). Minimum shipping and handling \$4.95. Software found to be defective will be replaced immediately. Defective hardware will be repaired or replaced at our discretion within the warranty frame of manufacturer. Defective items must be sent to 36 East 19th Street, New York, N.Y. 10003, Attn: Service Dept. Prices herein are for mail order and phone orders only. Store prices may differ. Some items are subject to availability. Due to manufacturers price fluctuations, the prices may change beyond our control. This ad supersedes all other ads.

Keep in touch with the latest items on the market and our up-to-date sale prices by checking our weekly ads in the National editions of the N.Y. Times and Wall Street Journal.

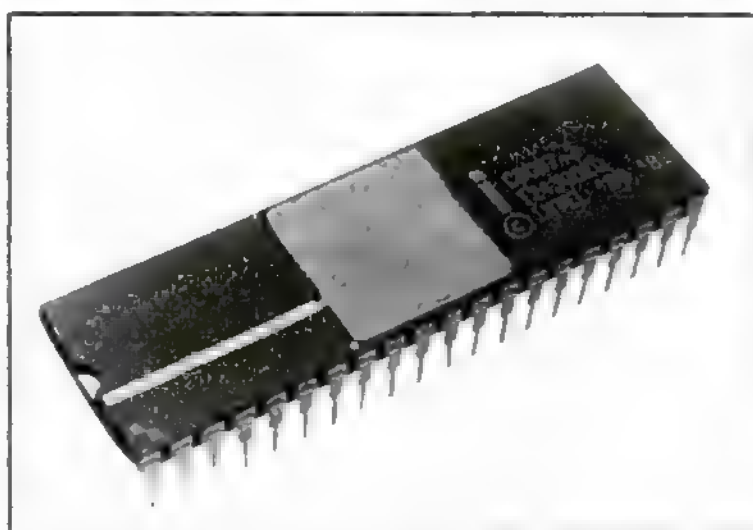
IBM® is a registered trademark of International Business Machines Inc.
PC Magazine Oct. 30, Submitted Aug. 29, 1984

THE 8087 IS IN STOCK!

MicroWay* is the world's leading retailer of 8087s. We also have the most accurate statistics on chip reliability. They are: .01% infant mortality, .00% adult mortality and .02% 8088 incompatibility. As for ease of installation, we have never had a customer return a chip because of bent pins. We are so confident that you will be able to successfully install and use the chip that we offer a 180-day warranty with every chip we sell. That's 90 days more than anyone else!

To support the 8087 we stock the largest selection of 8087 software anywhere. This includes: three FORTRANs, three PASCALs, APL, Intel's ASM86, PL/M-86, several Cs, 87BASIC, 87MACRO and MATRIXPAK. For real time or multi-user applications we offer RTOS™ - our implementation of Intel's iRMX executive. Our new products include a professional debugger with 8087 support, an interface library which enables MS Fortran users to call the IBM Basic

Compiler Library, and a translator that converts object modules into readable assembly language files. If you have a question about which computer, language, compiler, operating system or application package is best suited to your problem, we can answer it. Just call:
Information and Orders—
617-746-7341
University, Corporate and
Government Buyers—
617-746-7364



MicroWay™ 8087 Support

MWS-286™ Configured to your specifications, our computer runs RTOS-286 or XENIX. Includes one Intel compiler, seven slot multibus chassis, hard disk, streaming tape backup and Intel Service Contract. Six to twenty times faster than your PC **CALL**

**REAL TIME MULTI-TASKING/
MULTI-USER EXECUTIVE - RTOS**
RTOS is a MicroWay configured version of iRMX-86. Includes ASM-86, LINK-86, LOC-86, LIB-86, and the ROM Hex Loader..... **\$600**

87FORTRAN/RTOS™ - our adaptation of the Intel Fortran-86 Compiler generates in line 8087 code using all 8087 data types including 80-bit reals and 64-bit integers. The compiler uses the Intel large memory model, allowing code/data structures of a full megabyte, and supports overlays. Includes RTOS and support for one year **\$1350**

87PASCAL/RTOS™ is Intel's ISO-Standard Pascal with 8087-8088 exceptions. These make it possible to use all the 8087 data types directly, while generating modules in one of the three Intel Memory Models. Includes RTOS and support for one year..... **\$1350**

RTOS DEVELOPMENT PACKAGE
includes 87FORTRAN, 87PASCAL, PL/M-86, Utilities, TX Screen Editor and RTOS.... **\$2500**

OBJ→ASM™ - a multipass object module translator and disassembler. Produces assembly language listings which include public symbols, external symbols, and labels commented with cross references. Ideal for understanding and patching object modules and libraries for which source is not available **\$200**

FFT87 an FFT package for the 8087. Performs Forward and Inverse Transforms on complex data. Callable from SSS or MS Fortran..... **\$150**

MATRIXPAK™ manages a **MEGABYTE!** Written in assembly language, our runtime package accurately manipulates large matrices at very fast speeds. Includes matrix inversion and the solution of simultaneous linear equations. Callable from MS Fortran 3.2, 87MACRO, 87BASIC, and RTOS..... each **\$150**

87BASIC™ includes patches to the IBM Basic Compiler and both runtime libraries for USER TRANSPARENT and COMPLETE 8087 support. Provides super fast performance for all numeric operations including trigonometrics, transcendental, addition, subtraction, multiplication, and division **\$150**

87BASIC/INLINE™ generates inline 8087 code! Converts the IBM Basic Compiler output into an assembly language source listing which allows the user to make additional refinements to his program. Real expression evaluations run seven times faster than in 87BASIC..... **\$200**

87MACRO™ - our complete 8087 software development package. It contains a "Pre-processor," source code for a set of 8087 macros, and an object library of numeric functions including transcendental, trigonometrics, hyperbolics, encoding, decoding and conversions **\$150**

87DEBUG™ - a professional debugger with 8087 support, a sophisticated screen-oriented macro command processor, and trace features which include the ability to skip tracing through branches to calls and software and hardware interrupts. Breakpoints can be set in code or on guarded addresses in RAM..... **\$150**

FOR→BAS™ - a library of interface routines which allow MS Fortran programs to call the IBM Basic Compiler library and access features such as the RANDOM NUMBER GENERATOR, SOUND, PLAY, DRAW and SCREEN commands..... **\$150**

8087-3 CHIP..... \$175
including DIAGNOSTICS and 180-day warranty

64K RAM Set..... \$45

256K RAM Set.... \$325

80287 CHIP..... \$350

8087 8mhz..... CALL

MICROSOFT FORTRAN 3.2.... \$239

MICROSOFT PASCAL 3.2..... \$209

These IEEE compatible compilers support double precision and the 8087.

**DIGITAL RESEARCH
FORTRAN..... \$279**

MICROSOFT C COMPILER includes
Lattice C and the MS Librarian..... **\$329**

LATTICE C with 8087 support **\$329**

FLOAT87 for MS C..... **125**

SuperSoft Fortran 86..... **329**

Computer Innovations C86..... **345**

STSC APL★PLUS/PC..... **500**

TURBO PASCAL or SIDEKICK **45**

TOOLBOX **45**

TURBO PASCAL with 8087 Support **85**

HALO GRAPHICS **CALL**

GRAPHMATIC..... **125**

ENERGRAPHICS..... **295**

Professional BASIC..... **295**

COSMOS REVELATION **850**

SCO XENIX™ MICROSOFT..... **595**

MAYNARD WS1 HARD DISK..... **975**

MAYNARD WS2 HARD DISK..... **1139**

smARTWORK by WINTEK..... **895**

SPSS/PC..... **695**

**NO CHARGE FOR CREDIT CARDS
ALL ITEMS IN STOCK
CALL FOR COMPLETE CATALOG**

MicroWay

P.O. Box 79
Kingston, Mass.
02364 USA
(617) 746-7341

**You Can
Talk To Us!**

*Formerly MicroWare, Inc. -
not affiliated or connected with
MicroWare Systems Corporation
of Des Moines, Iowa.

**This
"Finger
Friendly"
keyboard**

will make you more productive everytime you turn on your IBM PC.

Finger Friendly

Do you love your PC, but hate its keyboard? Would you like to have a quiet keyboard, with keys in the standard typewriter position? Now there is a low cost alternative to the IBM keyboard. Look at the improvements:

- ☐ **A Wider, Left Hand Shift Key/in the Standard Typewriter Position.**
- ☐ **Full Width Return Key.**
- ☐ **Lighted Indicators on CAPS LOCK and NUM LOCK Keys.**
- ☐ **A Long ENTER Key Next to Ten Key Pad for Adding Machine-Like Entry.**
- ☐ **Long Life, Capacitive Key Switches with Micro-processor Control.**
- ☐ **No Irritating Clicking Sound.**

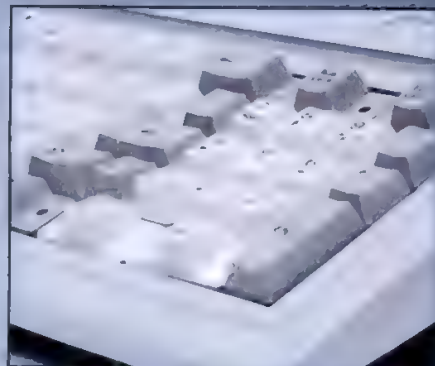
- ☐ **Finger Homing Bumps on F, J, and 5 Key of Numeric Pad.**
- ☐ **Two Stage Key Resistance Gives Tactile Feedback Through Your Fingers, not Your Ears.**

And those are just the improvements! You don't have to give up the color matched, low profile case. Or three position height adjustment. It's the enhancement that will make you more productive everytime you turn on your PC.

About Us

Although we sell our products direct to you, don't confuse us with mail order companies. You see, we only sell a few selected products, which we stock in depth, and service right here in our own facilities. So you get the mail order sized price, and support based on extensive experience with our products. When you call us you get informed answers.

Whether it's a Qubie' modem, standby power system, multi-function board, or keyboard — we are ready to help you before and after the sale. And if you would rather buy from a local



dealer, no problem. Many dealers now stock Qubie' products, with more adding them each day.

All our products come with our 30 day satisfaction guarantee. If you are not completely satisfied you may return the keyboard for a refund, including the postage to send it back. In fact, we suggest you get a competitor to make the same offer, buy both products, and return the one you don't like. We know which one you'll keep.

DEALER INQUIRIES INVITED

IBM is a trademark of International Business Machines Corporation.

Order Today, Shipped Tomorrow!

Price includes UPS surface freight and insurance. Add \$7.50 for two day air service. For fastest delivery send certified check or credit card. Personal checks take 18 days to clear. Calif. residents add 6% sales tax. Corporations and Institutions call for purchase order details.

(800) 821-4479

Toll Free Outside California

(805) 987-9741

Inside California

QUBIE'

4809 Calle Alto
Camarillo, CA 93010

Tempo House, 15 Falcon Road,
London SW11 2PH, United Kingdom

© Copyright Qubie 1984

**ALSO
AVAILABLE
FOR PC Jr.**

Qubie' Finger Friendly Keyboard,
with 1 year warranty.

Part No. FF5150JR \$139.

Part No. FF5150 \$139.

CIRCLE 384 ON READER SERVICE CARD

You'll find the excitement under the covers.

The most exciting computer news since the micro: Framework.™

It's idea processing, word processing, electronic spreadsheets, database management and automatic graphics. With a unique outlining feature that allows you to put it all together more easily than ever.

Whether you're a novice or a techie, Ashton-Tate has a Framework book to explain the program, its language and application in the detail you require.

Framework: An Introduction, by Bill Harrison

The first in a series of Framework books designed to show users how to take advantage of this new program's flexibility. Includes explanations of all of Framework's major features. A must for first-time users. Suggested retail price \$15.95.

Framework: On-The-Job Applications, by Expert Systems, Inc.

A collection of timesaving applications for those interested in putting Framework to use immediately. An ideal book for business professionals who don't have time to develop their own applications. Suggested retail price \$19.95; with disk, \$29.95. Available Fall '84.



Framework: A Programmer's Reference, by Forefront Corporation

A reference source for programmers developing applications with Framework. Includes a programming tutorial and an extensive functions directory for the FRED™ programming language. Suggested retail price \$24.95.

Framework: An Introduction to Programming, by Forefront Corporation

A first-time-user's introduction to Framework programming. With an extensive tutorial on the functions and capabilities of the software. Suggested retail price \$19.95. Available Fall '84.

Framework: A Developer's Handbook, by Forefront Corporation

A complete handbook for the Framework program developer. Organized for quick and easy access. An invaluable addition

to any developer's library. Suggested retail price \$24.95. Available Fall '84.

So if you're thinking of buying the program, buy the book, too. They're made for each other. And both are made for you.

And Ashton-Tate has a rapidly-growing library of micro-computer-related books for computer users of every level. To get a copy of our latest catalog, contact your local Ashton-Tate dealer. For the name and location of your nearest dealer, contact Ashton-Tate, 10150 West Jefferson Boulevard, Culver City, CA 90230. (213) 204-5570.

ASHTON-TATE

© Ashton-Tate 1984. All rights reserved. Framework and FRED are trademarks of Ashton-Tate.

Naming the Rose

The PC AT by any other name would smell as sweet, but how it was named in the first place is a strange and apocryphal tale. The little tramp, it seems, was not man enough for the new machine.

PC AT. We all know what "PC" means, but "AT"? You might think it stands for "Advanced Technology." Or maybe "Absolutely Terrific." There are even some who feel that it is a sly IBM riposte to AT&T's double entendre "Watson, watch us now" pitch.

Well, forget it. IBM simply abbreviated the name of a famous former world leader, entrepreneur, politician, and marketer. The folks at IBM knew they had something special in this new machine when it was still on the test bench, and they wanted credit where credit was due. They knew the machine would come to dominate the personal computing market, as surely as the original PC already has. The new PC's name had to reflect its destiny.

PC HH?

Our spies tell us of the many names IBM and its admen tried on and of the numerous failed attempts at devising a proper marketing scheme for the new machine. Only now can the tale be told. Forget all that Popcorn jazz; that was just a treacly Clark Kent cover-up to use while they tried out names like Dominator, Conqueror, and Vanquisher. "Too Detroit," said the admen. "People will want to know how much is the Corinthian leather upholstery."

"Well," the IBMers rejoindered, "how about a good, forceful name like Viking?"

"Viking? VIKING?" The admen were incredulous. "You're gonna let



Bill Machrone

that wimp tramp peddle a Viking?"

The IBMers allowed as to how maybe the tramp had run his race. Time to come up with a new image, they said.

"Yeah," said the admen. "We could do a knockout campaign based on Hagar the Horrible." One of them jumped up in a fit of enthusiasm. "Great! Let's run it up the flagpole and see who salutes!"

There was dead silence in the room. All eyes turned to him, and, after a long pause, the top adman said, "Why don't you get your feeble brain out of 1959 and

call Dik Browne's agent?"

Once he had left, though, enthusiasm mounted for the idea.

"I can see it all now," said one. "Hagar and Lucky Eddie sitting around the breakfast table, having an eye-opening cup of mead. Helga walks in and asks, 'So what are you going to do today?'"

"Hagar says, 'Well, now that I've cornered the U.S. market and beaten the Common Market countries into submission, I think I'll go for total world domination.'"

"That's nice, dear," says Helga. "Don't forget to take out the garbage." "

As the admen picked themselves up off the floor, they noticed that the IBMers were tight-lipped.

"No cartoon characters," said one, "This is serious business."

PC CB?

"Okay, already," said the admen. "You want serious, we'll give you serious. Hmmm. Lemme see. I got it! Conan the Barbarian! You're strong, he's strong. We can get Schwarzenegger to do the ad spots. I can see him now, holding a Compaq Deskpro in one hand and an AT&T micro in the other and bashing them together in slo-mo. The camera comes in tight on the crazy gleam of triumph in his eyes as a million tiny pieces swirl to the ground." (continued)

Meet the



Standard.

AST SixPakPlus™ has set the standard 100,000 times.

We have manufactured and shipped more than 100,000 SixPakPlus multifunction boards—an event that proves quality and quantity are compatible. AST has maintained the same high set of quality standards from our first SixPakPlus board, to our 100,000th in less than a year. No one in the industry has set that kind of standard!

Important as it is, quality is just one of the factors that has made SixPakPlus the most popular, most respected multifunction board available today.

Broad performance capabilities is yet another.

SixPakPlus provides users of the IBM PC and XT and their compatibles with an ideal combination of enhancements to give you all these benefits on a single board:

- When you need more memory to run sophisticated software programs and process more data, the SixPakPlus gives you an additional 64K to 384K RAM.
- If you want to add peripherals such as printers, modems, mice, plotters or joysticks, we give you more Input/Output ports—serial, parallel and optional game adapter.
- More convenience, thanks to a built-in clock-calendar that

provides automatic time and date stamping.

- More productivity with SuperPak™ utility diskette including SuperDrive,™ PC World's User Survey award-winner, that works like a drive but fifty times faster—and SuperSpool™ so you can print and input at the same time.

Quality even extends to the documentation, making SixPakPlus one of the easiest hardware/software packages to install and operate.

We continue to set the standards by providing the best possible user information. In fact, with our new audio cassette you don't even have to crack our manual to learn how to take full advantage of all SixPakPlus features and functions.

Now meet the standard for multifunction enhancement boards in person. Get a SixPakPlus from a dealer near you—the proven winner for your PC expansion needs. SixPakPlus is a member of the complete AST family of multifunction boards; Micro-to-Mainframe communications, LAN and graphics products.

Contact: AST Research Inc.,
2121 Alton, Irvine, CA 92714
Telephone: (714) 863-1333
TWX: 753699ASTR UR

*IBM PC and XT are registered trademarks of International Business Machines



AST
RESEARCH INC.

CIRCLE 101 ON READER SERVICE CARD

EDITOR'S SCREEN

"Impolitic," said one IBMer. "Too macho, too chauvinistic. What do you take us for?" The rest nodded their heads. The admen just sighed.

PC GK?

"Okay, okay, you want somebody real, not mythical," said the top adman. "Great strength. Personal charisma.

Memorable name. Left his mark on the world."

He saw the IBMers nodding in agreement.

"Genghis Khan," he said.

"No," they said.

"Aw, come on, you guys! He's perfect. We could get Toshiro Mifune or. . . ." He stopped when he saw an IBMer twisting a piece of paper as though it were a pale, fragile neck.

"Look," the IBMer said evenly. "We have an image to support. Our concepts are simple. We're big, powerful, international, paternalistic, marketing-driven, and not afraid of a good fight. There are enough people in our industry already who are nervous about the Far East taking over the industry. Besides, Mifune is Japanese."

PC AT

All this time, one of the admen, the psychological consultant, had remained silent. He took a long pull on his pipe and worried his beard with the stem.

"So, you want a father figure," he began. "A strong presence that doesn't insult you with its obviousness. Something that whispers a subliminal suggestion of power. Someone of mythic proportions, one that transcends mere reality." He watched the IBMers exchange glances.

"There have been many great and powerful men who have sprung from or ruled over Central Europe. From Albert Einstein to Count Dracula, they have left an indelible impression on our collective subconscious minds." The IBMers winced at the mention of Dracula, but the consultant went on.

"Even the earliest rulers are still in our hearts and minds today. So, the name should be 'PC AT,' which will carry a strongly resonant, psychohistorical frame of reference. So strong, in fact, that you won't need a huckster like the tramp. Just the first two letters of his name."

"And just who is this perfect paradigm for us?" asked the IBMers.

"Attila the Hun," he answered. ■

See us at
COMDEX/Fall
Booth M1037
MGM Grand Hotel

Beyond Board-Driven Networks

MultiLink™ is a unique networking system which *doesn't* require costly "Network Interface Boards." Instead, it transforms ONE IBM PC/XT* (or compatible) into the CPU of a multi-tasking, multi-user network.

Four Workstations for the Price of One . . . with a Software-Driven Network. With MultiLink™, you can utilize up to eight inexpensive terminals as workstations. Four of these terminals cost less than one PC.

MultiLink™ runs under all releases of PC-DOS™ (except 1.0) and certain implementations of MS-DOS*. A wide range of leading programs which include WordStar*, Lotus 1-2-3™, Peachtext 5000™, and dBASE II* are fully supported.

A Resource-Sharing System. Multiple users are able to access all of your computer's resources, locally, or from remote locations using a terminal with a modem. Features include disk, file, and program-sharing, a dial-in bulletin board, and a comprehensive print spooler.

Make the MultiLink™ Connection Today. Call The Software Link TODAY, and get the whole story. MultiLink™ is immediately available for \$295 and comes with a money-back guarantee. VISA, MC, and AMEX accepted.

MultiLink™



THE SOFTWARE LINK, INC.

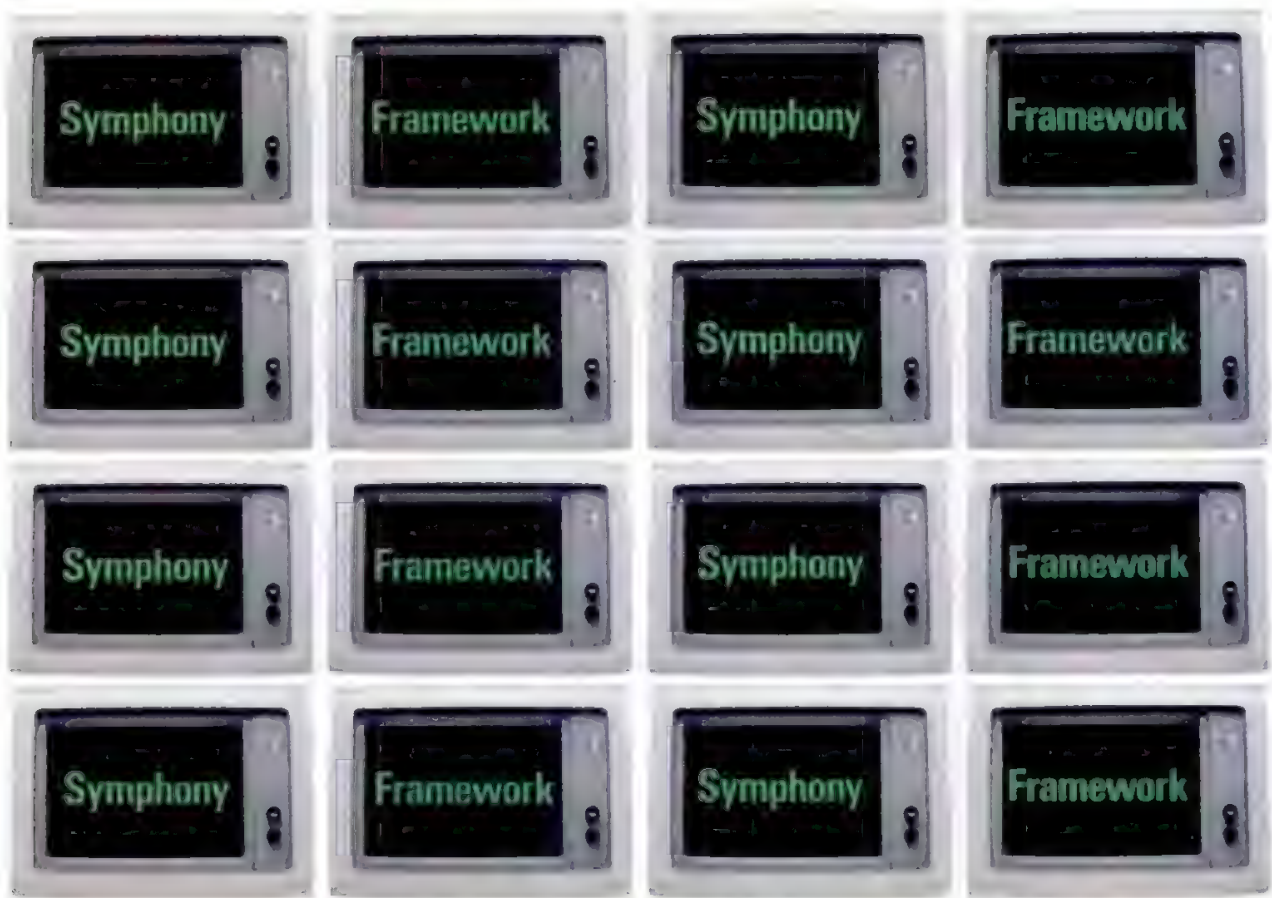
8601 Dunwoody Place, Suite 336, Atlanta, GA 30338 Telex: 4996147 SWLINK

CALL: 404/998-0700

Dealer inquiries invited



CIRCLE 393 ON READER SERVICE CARD



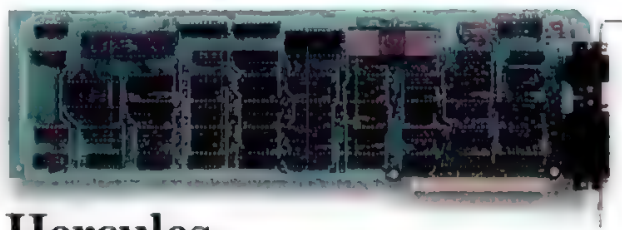
And you thought we only ran 1-2-3.

Hercules™ is famous for being the only high resolution graphics card authorized by Lotus™ to run 1-2-3.™ Now we are the only graphics card authorized to run a couple of other programs you may have heard about —Symphony™ and Framework.™

When these hot new programs wanted hot graphics, they chose to support the undisputed leader, Hercules. When you've sold over 100,000 graphics cards, the world takes notice.

At Hercules, we believe that the most important feature in a graphics card is that it should run lots of software — with true full-screen, high resolution graphics on the IBM® PC Monochrome Display. So when you buy a Hercules Graphics Card, you can rest assured that it will run more graphics software than anyone else. Even on the new AT.™

Call 800 255-5550 Ext 400 for the name of the Hercules dealer nearest you. See why the company that made the first graphics cards for the IBM PC still makes the best.



Hercules.
We're strong on graphics.

Address: Hercules, 2550 Ninth St., Berkeley, CA 94710 **Ph:** 415 540-6000 **Telex:** 754063 **Features:** IBM Monochrome Display graphics resolution of 720 x 348; parallel printer port, full text mode software compatibility; free programming software; 2 year warranty. **Foreign distributors:** Compuserve/Canada; Reflex/U.K.; Computer 2000/W. Germany; Edisoft/France; Imagineering/Australia; Holland Info Products/Holland; DataTeam/Scandinavia **Trademarks/Owners:** Hercules/Hercules Computer Technology; Lotus, 1-2-3, Symphony/Lotus Development; Framework/Ashton-Tate; IBM, AT/International Business Machines.

CIRCLE 146 ON READER SERVICE CARD

A BUREAUCRAT'S GUIDE TO WORD PROCESSING

Now, if it were you or I and we wanted a word processing program for our IBM-type PC, we'd probably stop off at our local computer store and simply diddle with a few.

You and I, however, are not the U.S. Department of Agriculture.

(Nor any of its permutations of subsystems like the Economic Research Service, National Resources Economics Division, Data Services Center, etc., etc.)

So when the USDA told ERS to tell NRED and DSC to look into a truckload of w.p. programs for all their PCs, the last thing they wanted was simple diddling. Their dedicated Wangs and Lexitrans were far too few to handle their

needs, their IBM® PCs weren't compatible with them anyway, and nobody really, quantifiably, knew from word processing with a personal computer.

Definitely not a diddling-mode condition.

As they put it in The Exchange, an internally distributed publication of the Department of Agriculture: "A needs assessment showed that, in the long-term, a word processing system is needed that can increase word processing capability and also be compatible with ERS' Long Range Information Management goals."

Well, "Needs assessment" led swiftly to "procurement action," which galloped into an "objective review" of the eight top-rated PC programs on the market (as compiled by The Ratings Book published by Software Digest), along with Wordstar® and Display Write 2, because they had some around.

Thus armed with the names, the final evaluators (a team of secretaries from NRED who would be the primary users of the PC software) became armed with each of the programs, along with checklists to record such things as ease of use, advanced features, and similarity to their existing dedicated equipment.

The first to be eliminated from the prospect list were Office Writer™

and Samna™, since they're copy-protected and couldn't be transferred to hard disks.

Next, IBM's Display Write 2: because it's "not compatible with other software used in ERS (like Lotus 1-2-3™, dBASE II®, etc.)," and it's "full of confusing menu options and cryptic error messages." Au revoir IBM.

Then, three more, for a variety of reasons.

Which left the following:

Volkswriter® Deluxe™

MultiMate™

Leading Edge™


Volkswriter Deluxe? "Too complicated and confusing." Not "easy to learn or use."

MultiMate? Not bad. It actually tied the winner in a few categories.

The winner being the one that won 82% of the votes in the Ease of Use/Ease of Learning categories. The one about which they said, "The ability to store deleted text and automatic document backup features were both highly desirable." The one they thought they'd quickly "be able to use . . . for their day-to-day word processing tasks."

The whole process took some three months of work by people in DSC to support the NRED in its work with the ERS and DSC to make the world a better place for the USDA.

But the results were well worth the wait. Because at last they've solved their word-processing problems . . .

"With Leading Edge!"  LEADING EDGE

THIS WAS THE WINNER:
LEADING EDGE™
LEADING EDGE WORD PROCESSING

THESE ARE THE PACKAGES THE COMMITTEE EVALUATED:



THESE WERE THE FINALISTS:



LEADING EDGE PRODUCTS, INC.
LEADING EDGE SOFTWARE DIVISION, 21 HIGHLAND CIRCLE, NEEDHAM, MA 02194. TEL. 800-343-3436. (617) 449-4655
HELP HOTLINE 800-523-HELP

IBM is a registered trademark of International Business Machines.

CIRCLE 280 ON READER SERVICE CARD

Bringing the PC to Life

Voice synthesis and videodisk technology can broaden business applications of the PC while also providing a compelling learning alternative for managers.

Many managers trying to integrate PCs into their offices are echoing the question of the year: "Where's the beef?" They want to know how they can make use of the PC other than for word processing and spreadsheet functions, for which they generally have only a limited need.

To these managers, I present the case for two PC applications: the use of video and of voice in conjunction with traditional data processing, graphics, and text-based software. Since managers spend about 85 percent of their day engaged in visual- and audio-based learning activities, such as reading and attending meetings, I urge them to explore the possibility of using voice synthesis and optical videodisks to enhance these activities.

Voice synthesis can help managers cope with and use the enormous amount of information available to them through the over 5,000 external informational databases now in existence. I've found that managers who are exposed to relevant information from one of these systems will immediately find a cost justification for using the database, but I've also discovered that these managers will not read through more than three or four screenfuls of information at a time. With a voice synthesizer, the information from the external database can be output in

voice mode, and the manager can listen to it while continuing to perform his work and then store the output on a cassette for further access, either at home or in the office.



John J. Walsh

Of course, managers can absorb only so much information at one time and are often faced with information overload. When this occurs, they need to focus on one particular area. Personal computer-based interactive video, which is currently being used to deliver education in publishing, manufacturing, and marketing, may be the answer for the manager who doesn't have the time or money for traditional learning methods such as classes and texts.

Videodisk technology—a combina-

tion of computing, optical disk storage, communications, graphics, and lasers—can provide a self-paced learning environment. Managers can control the rate at which they learn because videodisk systems have forward, reverse, and interactive controls that provide special functions, such as random access to information and the ability to speed up or slow down, to freeze frames with extremely high resolution, and to zoom in.

Most importantly, PC-based videodisk technology offers a prototype learning environment for diverse fields. It simulates reality in ways that are flexible and paced to the individual learner. For example, when videodisk systems have been introduced into large corporate environments, users frequently come forward and suggest other learning applications for the system.

It's time to stop concentrating our efforts on devising text, graphics, and data applications and aggressively begin to explore the possibilities of voice synthesis and videodisk technology in our evolving PC environments. ■

John J. Walsh is a principal of the Visual Technology Group, Inc., a New York City-based company specializing in office automation and the use of interactive videodisk technology. He was formerly director of MIS at Avon.

Perfect Compatibility

IBM™ & ACP

HARDWARE SPECIALS

CONTROL DATA

Full Size 320K DS/DD . . . \$ 209*

*"The drive IBM trusted with its logo"

TEAC

Half-Height 320K DS/DD . . . \$ 179
"The #1 Rated Half-Height Drive"

64K RAM Chips 200ns Pre-Tested \$ 55

AST SIXPACK w/384K \$ 569

MAYNARD ELECTRONICS

10MB HARD DISK

(XT Lookalike) \$ 949

SOFTWARE SPECIALS

LOTUS 1-2-3/WORDSTAR

PROPACK \$ 639

LOTUS 1-2-3/HERCULES

GRAPHICS CARD \$ 679

SYMPHONY/SIXPACK

W/384K \$ 999

MULTIMATE w/80K Word

Speller \$ 269

An advanced word processor with all the features of a dedicated stand alone system.

dBASE III/QUICKCODE/dUTIL . . \$ 629

dB/COMPILER \$ 450

Neither dBase II nor Run-Time required. 30% less storage, faster execution assembly language interface

EASYWRITER II/PELLER/MAILER

. \$ 195

We carry a wide variety of Mainframe Communication and Local Area Networks. For advice about which will suit your needs best give us a call and let us review them with you.

HARDWARE

COMPUTER SYSTEMS

IBM

PC w/256K 2 DS/DD Disk Drives \$ Call

PC w/256K 1-360K Drive

1-10MB Hard Disk \$ Call

COMPAQ

w/256K 2 DS/DD Disk Drives \$ Call

COMMUNICATION PRODUCTS

HAYES

Smartmodem 300 \$ 209

Smartmodem 1200 \$ 489

Smartmodem 1200B w/Smartcom II . . . \$ 419

Smartmodem-to-IBM 6 ft. Cable \$ 25

Smartcom II \$ 99

TAC

Irma (Emulates 3278 Terminal) \$ Call

Irma Line (For Remote Emulation) . . \$ Call

FLOPPY & HARD DISK DRIVES

CONTROL DATA

Full Size 320K DS/DD \$ 209

Half-Height 320K DS/DD w/Bracket . . \$ 179

DAVONG

10 MB to 41 MB Hard Disk Int./Ext. . . \$ Call

IOMEGA

Bernoulli Box (10 or 20MB) \$ Call

TALLGRASS

12-70 MB Hard Disk w/Tape Backup . . \$ Call

TEAC

Half-Height 320K DS/DD w/Bracket . . \$ 179

Half-Height 640K DS/DD w/Bracket . . \$ 265

MAYNARD ELECTRONICS

10MB Hard Disk WS-1 (XT Lookalike) . \$ 949

10MB Hard Disk WS-2 (XT Lookalike) . \$1149

DISKETTES

SCOTCH 3M

DS/DD Box of 10 \$ 35

VERBATIM

DS/DD Box of 10 \$ 35

DISK CONTROLLERS

MAYNARD ELECTRONICS

Standard Disk Controller \$ 115

with Parallel Port \$ 165

with Serial Port \$ 175

Sandstar Modular Disk Controller . . . \$ 209

All Sandstar Modular Options Avail. . \$ Call

EXPANSION BOARDS

MAYNARD ELECTRONICS

Modular Memory Brd. w/64K to 576K . \$ 219

Modular Multifunction Board \$ 95

AST RESEARCH

(All AST boards include SuperDrive, SuperSpool and 1 year warranty)

SixPack Plus w/64K to 384K \$ 269

MegaPlus II w/64K to 512K \$ 269

Memory Board II w/64K to 384K \$ 239

I/O Plus II \$ 139

MegaPack w/128K or w/256K \$ Call

Parallel, Serial, Game Options \$ 35

ORCHID TECHNOLOGY

Blossom w/64K to 384K \$ 249

TECMAR

Captain w/64K to 384K w/Software . . \$ 269

QUADRAM

Quadboard w/64K to 384K \$ 269

PRINTERS & PLOTTERS

C. ITOH

Starwriter Letter Quality 40 cps . . . \$1195

Printmaster Letter Quality 55 cps . . . \$ Call

Cut Sheet Feeder (Feeds 200 sheets) . . \$ 445

EPSON

(All Printers include GRAPHTRAX-Plus)

RX-80 (120 cps, 80 cols) \$ Call

RX-80 F/T (120 cps, 80 cols) \$ Call

RX-100 F/T (100 cps, 132 cols) \$ Call

FX-80 F/T (160 cps, 80 cols) \$ Call

FX-100 F/T (160 cps, 132 cols) \$ Call

Epson-IBM Cable \$ 30

HEWLETT PACKARD

HP-7470A Two Pen Plotter \$ Call

HP-7475 Six Pen Plotter \$ Call

HP-IBM Cable (works w/Lotus 1-2-3) . . \$ 50

NEC

NEC 3550 Letter Quality 35 cps \$1699

NEC 2050 Letter Quality 18 cps \$ 895

Bi-Directional Tractor \$ 235

Cut Sheet Feeder (Feeds 200 Sheets) . \$ 445

NEC-IBM Cable \$ 30

OKIDATA

Microline 83A (120 cps, 132 cols) . Best Price

Microline 92 (160 cps, 80 cols) . . . Best Price

Microline 93 (160 cps, 132 cols) . . . Best Price

Microline 84 (200 cps, 132 cols) . . . Best Price

Plug n' Play Best Price

Okidata-IBM Cable \$ 30

SILVER-REED

EXP 550 (20 cps, 132 cols) \$ 595

MONITORS

AMDEK

Video 300 Green Screen \$ 140

- No Credit Card Surcharge
- Special Corporate Accounts Division
- Company P.O. Accepted
- Training
- Equipment Maintenance
- Next Day Shipping

WE'LL GIVE YOU \$10.00!

Simply refer to this reference number-PM1 with your order and receive \$10.00 credit toward your next purchase.*

*Minimum order \$100.00. Limit one credit per customer

Ref. #PM1

Video 300A Amber Screen	\$ Call
Video 310A IBM Monochrome in Amber	\$ 170
PRINCETON GRAPHICS	
HX-12 RGB Hi Resolution Color	\$ 499
Max-12 IBM Monochrome in Amber	\$ Call
SR-12 Hi Resolution Color	\$ Call

VIDEO—MONITOR BOARDS

HERCULES	Graphics Card	\$ 359
	Color Card	\$ 179
PC COMPONENTS	Bi-Graphix I	\$ Call
PARADISE SYSTEMS	Multidisplay	\$ 339
PC+ PRODUCTS	Colorplus	\$ 419
STB	Graphix Plus	\$ 389
QUADRAM	Quadcolor I	\$ 199
TECMAR	Graphics Master	\$ 499

MISCELLANEOUS

Cables (all extension cables)	\$ Call
8087 Co-processor	\$ 179
KEY TRONIC	
Deluxe Keyboard (KB 5151)	\$ Call
KOALA—Touch Tablet w/Software	\$ Call
KRAFT—Joystick	\$ 49
T.G.—Joystick	\$ 49
MOUSE SYSTEMS—PC Mouse	\$ Call

SOFTWARE

ALPHA	Database Manager II	\$ 199
ASHTON TATE	dBase II	\$ 285
	dBase III	\$ Call
	Framework	\$ Call
ATI	All Software Training Pkgs	\$ 55
BORLAND INT'L	Turbo Pascal	\$ 45
	Sidekick	\$ 45
CENTRAL POINT SOFTWARE	Copy II PC	\$ 35
FOX & GELLER	Quickcode II or III	\$ 169
	dGraph (Requires Graphics Card)	\$ Call
	dUtil (Utilities For dBase II or III)	\$ Call
FUNK—Sideways		\$ 49
HAYES—Smartcom II		\$ 99
IMSI—4 Point Graphics (Rated #1)		\$ 119
	(Inhance Lotus Graphics)	
INDIVIDUAL SOFTWARE		
	Tutorial Set (IBM PC/XT and DOS)	\$ 79
	Typing Instructor	\$ 39
INFORMATION UNLIMITED SOFTWARE		
	EasyWriter II System (See Specials)	\$ 195
	Accounts Receivable	\$ 299

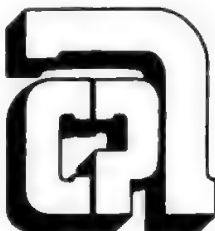
Accounts Payable	\$ 299
General Ledger	\$ 299
Payroll	\$ 369
INFOCOM—Zork I, II, III	\$ 29
All games available	\$ Call
LATTICE	
C-Compiler	\$ 299
C-Food Smorgasboard	\$ 110
LIFETREE	
Volkswriter Deluxe w/TextMerge	\$ 169
LIGHTNING SOFTWARE	
Master Type (Best Typing Tutor)	\$ 39
LOTUS DEVELOPMENT	
Lotus 1-2-3 (Version 1A)	\$ Call
Symphony	\$ Call
Symphony Upgrade	\$ Call
MICRO DATA BASE SYSTEMS	
Knowledgeman	\$ 299
MICROSOFT	
C-Compiler	\$ 349
Flight Simulator	\$ 35
Multiplan (New Version)	\$ 149
Project (Project Manager)	\$ 180
Chart	\$ 180
Word	\$ 239
Word w/Mouse	\$ 299
Mouse w/Software	\$ 139
MICROPRO	
Wordstar w/Tutorial on Disk	\$ 229
ProPack (Wordstar/MailMerge/CorrectStar/StarIndex)	\$ 329
ProfessionalPlus (ProPack plus TelMerge Electronic Mail System Mailing List Management and Business Letters)	\$ Call
MICROIM	
R.base 4000	\$ 299

Clout	\$ 139
Extended Report Writer	\$ Call
MICROSTUF	
Crosstalk XVI (for Hayes Smartmodem)	\$ 99
MORGAN COMPUTING	
Trace 86 (Assembly Language Debug)	\$ 99
Ted (Program Editor)	\$ 79
Professional Basic (170K Work Space w/8087 Support)	\$ 259
MULTIMATE INTERNATIONAL	
Multimate (See Specials)	\$ 269
PETER NORTON	
Norton Utilities	\$ 55
ROSESOFT	
Prokey (Newest Version)	\$ 95
SOFTWARE PRODUCTS	
Open Access	\$ 299
SATELLITE SOFTWARE INTERNATIONAL	
Word Perfect (includes Speller)	\$ 269
SORCIM	
Supercalc 3	\$ 199
SOFTWARE PUBLISHING	
PFS/Access	\$ 65
PFS/File	\$ 89
PFS/Graph	\$ 89
PFS/Report	\$ 79
PFS/Write	\$ 79
TALL TREE SYSTEMS	
J-Format 2.0	\$ 40
WORDTECH SYSTEMS	
dB/Compiler (True dBase II Compiler)	\$ 450
WANG PUBLICATION	
Random House Proof Reader (50K)	\$ 45

Our Policy

• We accept VISA, Mastercard, Money Orders, Certified Checks, Cashiers Checks, Personal Checks, Wired Funds • We do not charge your card until we ship • **No surcharge added on VISA and Mastercard** • Allow one week for personal and company checks to clear • COD maximum \$500 Cash or Certified check on delivery • Please use local phone number for order status inquiries • Prices subject to change without notice • Returns may be subject to restocking fee.

SHIPPING (U.S.). For monitors, printers, and hard disk drives add 2% to all orders. Blue label and Next Day Air available. For all other items add \$4. **Most orders shipped next day.**



**APPLIED COMPUTER
PRODUCTS INC.**

1916 Welsh Road #6, Philadelphia, PA 19115

215-934-6990 Telex 756876 UD

1-800-223-3860

When you need competitive prices, prompt service and complete support, call us.

*IBM is a registered trademark of International Business Machines.
CIRCLE 129 ON READER SERVICE CARD

COMMUNICATIONS SOFTWARE THAT INTEGRATES WITH ANY PROGRAM.

SOFTERM IS ALSO AVAILABLE IN
VERSIONS FOR APPLE II® AND
TANDY 2000 PERSONAL COMPUTERS.



Here's the first software that lets you integrate communications with all your favorite programs. Now you can add concurrent communications to programs like Lotus 1-2-3™, dBase III™, WordStar®, or any other IBM PC compatible software. Softerm PC™ can function two ways—as a stand-alone program or as an extension to your PC-DOS operating system to let you access Softerm's capabilities while using other programs.

Simple to use.

Softerm PC lets you interrupt any program simply by pressing one key. You can then use disk utilities, print a file, dial a host computer, use terminal mode, or initiate a file transfer. Then you can continue working in the original program while the other tasks are performed concurrently. You can even receive electronic mail while you work.

Hooks your PC to any mainframe.

Softerm PC lets you access information services, bulletin boards, electronic mail systems, and even your company's computer. It has all the features you need, including keyboard macros, built-in phone book for automatic dialing, and simultane-

ous capture to print or disk. Softerm's extensive file transfer capabilities include automatic execution using command files, support for popular protocols like XMODEM, and our own Softrans™ protocol which includes an adaptable source program for your host computer.

Do it all together. In real time.

Softerm PC supports concurrent operation of up to 4 communications ports and 3 printer ports through background processing queues. Now you can operate your system to its full potential by simultaneously using your available ports for printing or communications functions. Real-time scheduling eliminates unnecessary pauses and gives maximum throughput for smooth, efficient operation.

Complete emulation of 24 terminals.

Softerm PC is not limited to basic TTY terminal

TERMINAL EMULATIONS

TTY Compatible	HP 2622A
ADDS Regent 20	Honeywell VIP7205
ADDS Regent 25	Honeywell VIP7801
ADDS Regent 40	Honeywell VIP7803
ADDS Regent 60	IBM 3101 Model 10
ADDS Viewpoint	IBM 3101 Model 20
Data General D200	Lear Siegler ADM-3A
Datapoint 3601	Lear Siegler ADM-5
DEC VT52	TeleVideo 910
DEC VT102	TeleVideo 925
Hazeltine 1400/1410	TeleVideo 950
Hazeltine 1500	User Defined
Hazeltine 1520	

emulation. It includes *exact* emulations of 24 popular terminals and provides all keyboard and display functions. Also, both conversational and block modes are supported. If Softerm PC is not completely compatible with your application, return it for a full refund.

The best communications software on the market.

Right now you can buy the best communications software on the market for only \$295. And that's a real bargain when you consider all the things Softerm PC will do. Plus, you get an unconditional 30-day money-back guarantee. So ask your dealer for a demonstration today.

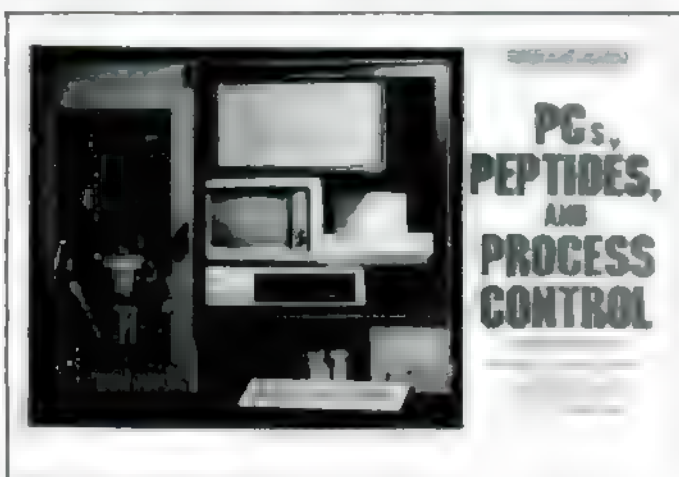
SOFTRONICS

3639 NEW GETWELL ROAD, SUITE 10
MEMPHIS, TENNESSEE 38118, (901) 683-6850

Letters to PC

Synthesis with a PC

Robin Raskin's excellent article "PCs, Peptides, and Process Control" (*PC*, Volume 3 Number 16) on the use of an IBM PC for chemical synthesis was most interesting.



As our colleagues at Rockefeller University do, we choose the PC, but rather than retrofitting it to an existing instrument, we designed a new, highly sophisticated, automated synthesizer that we call Syn-Thor 2000. Our choice was influenced by the number of compatible programs it runs, the quality of the color monitors, the numerous add-on I/O boards, and by the many researchers who either have or want an IBM PC in their labs.

Arno F. Spatola, Ph.D.
Louisville, Kentucky

Missing Floppies

I am a very satisfied subscriber to *PC Magazine* whose needs for software reviews, hardware reviews, and relevant information of all sorts have been very well filled by *PC*. I'd like to point out a gap that exists both in the realm of human knowledge and in your coverage of important issues.

This most basic and fundamental body of knowledge that is missing from our collective consciousness focuses on one thing—the floppy disk. Why have we not

seen a comprehensive review of this most important cornerstone of the personal computing field?

The world needs and cries out for an in-depth analysis of floppy disk materials, including the longevity, quality, and readability of the major brands of diskettes. I hope that *PC* can fill this need.

Richard Goldstein
Rochester, New York

We have examined the effects of environmental conditions on floppy disks ("Stress Tests for Floppies," PC, Volume 3 Number 13). As for a comprehensive review, we're thinking about it.—Ed.

More on Electric Desk

I would like to clarify some of the points I made in my review of *Electric Desk* in *PC News* ("Electric Desk: Organized, But Several Small Mars," *PC*, Volume 3 Number 18, page 60).

I said that *Electric Desk* will not gracefully support two different kinds of printers. However, if your file uses no special functions, such as underlining, superscripting, or boldfacing, you can safely switch from one printer to another without customization. If your file does contain these special functions you must make some special preparations. For example, if you customize *Electric Desk* for an Epson printer, then wish to switch to a NEC 3550 formed character printer, it is necessary to remove the write-protect tab from the disk.

This is not inherently risky; however, there is the chance that if the command is entered incorrectly, or if you forget to replace the write-protect tab, the disk could be inadvertently clobbered with files that you did not intend to have written onto the system disk.

Also, I said that "any attempt to write

to a write-protected disk will throw the user back into DOS mode." This is an overstatement and will not happen in every instance.

I hope this clarifies my point.

Howard Karten
Randolph, Massachusetts

We're Glad You're Clean

May we have permission to reprint your article "We're Clean" (*PC*, Volume 3 Number 16)? We'd like to distribute copies to our customers.

Your statement is clear, concise, and cogent; your policy could not be stated better.

S.J. Mesh
IBM Corp.
White Plains, New York

This letter is typical of the many favorable responses we have received from readers regarding software copying. As for permission to reprint the article, we'd love to say yes, but we can't. The person to contact is Jean Lamensdorf, Ziff-Davis Publishing Company, One Park Ave., New York, NY 10016. She's from Australia, she's really nice, and she'll probably let you do it.—Ed.

Manufacturer's Responsibility

I was delighted with Barbara Krasnoff's article "Consumer Guinea Pigs" (*PC*, Volume 3 Number 17). As a consultant and sometime beta tester, I think she hit the nail on the head about consumer guinea pigs. Even when beta testers are used, manufacturers invariably send us incomplete products with little or no usable documentation. I've noticed that even before we can finish a very short analysis of the program, *PC Magazine* is out with an advanced report of the software, usually with warnings that the program was an

TOGETHER,
STOPPING
YOU.



THERE'S NO

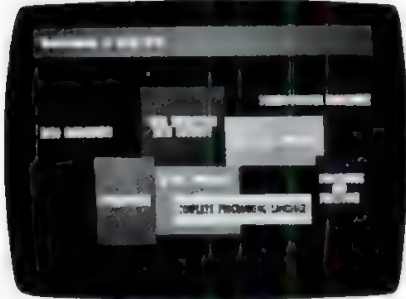
KnowledgeMan™ and You. The possibilities are endless.

To succeed in business, you need a partner that's fast, flexible, intelligent and easy to work with. A partner that can help turn your big ideas into well-conceived reality. One that gives you the support you need to make critical decisions confidently.

No partner can give you more of what you need than KnowledgeMan, the knowledge management software from MDBS.

A powerful partner.

KnowledgeMan helps you manage more knowledge, in more ways, than ordinary software. It can help you make better decisions on just about everything from production scheduling to market



forecasting. KnowledgeMan and its optional components offer data management, spreadsheet analysis, statistical analysis, text processing, forms management, business graphics, programming and more.

The key to KnowledgeMan's versatility is its exclusive synergistic integration, allowing you to accomplish your computing needs within one program. Unlike other software, there's no need to exit one function before entering another. The result: different kinds of processing can be intermingled. Quickly and easily.

A partner that speaks your language.

For all of its power and sophistication, KnowledgeMan is remarkably simple to understand. Even a beginner can start putting KnowledgeMan to work in minutes. With a single query, you can obtain related data from unlimited multiple tables. You can even teach KnowledgeMan to understand your own jargon.

A partner that helps you along.

The on-line HELP facility allows you to draw on 6800 lines of helpful information organized into 380 screens. If you have a problem or question, KnowledgeMan allows you to access the pertinent HELP screen immediately. Each screen is carefully designed to provide a quick reference guide to KnowledgeMan commands.

A partner that gives you room to grow.

Ordinary software packages can be frustratingly easy to outgrow. Not KnowledgeMan. Each KnowledgeMan component has more power than you'll probably ever need—far more than conventional integrated programs. With KnowledgeMan, you don't sacrifice capability, capacity or convenience. So with KnowledgeMan, you spend your time solving problems—not trying to overcome software limitations.

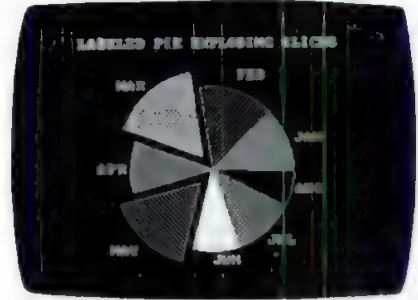
A partner that protects your interests.

KnowledgeMan offers sophisticated security features. Unauthorized access to data is next to impossible, thanks to password checking, thousands of access code combinations and data encryption.

So your secrets are safe with KnowledgeMan.

A partner you can build on.

To add yet another dimension to KnowledgeMan's capabilities, you can get fully-integrated options like K-Graph, an extensive business graphics facility that



lets you plot information in a variety of colorful graphs, charts and diagrams. For text processing, the K-Text option lets you incorporate data into written documents quickly and easily. Or, create highly-polished, full-color customized forms with K-Paint, our forms painting option. To short-cut the keyboard, put the K-Mouse option to work.

A partner you should get to know better.

To see KnowledgeMan in action, visit your dealer. Or contact Micro Data Base Systems, Inc., P.O. Box 248, Lafayette, IN 47902, (317) 463-2581, Telex: 209147 ISE UR.

It may be the beginning of a long, successful partnership.

Current version is 1.07 as of 9/10/84. KnowledgeMan, K-Graph, K-Paint, K-Text, and K-Mouse are trademarks of Micro Data Base Systems, Inc. MDBS is a registered trademark of Micro Data Base Systems, Inc.

**KNOWLEDGE
man**
The Knowledge Management Software
from MDBS

LETTERS TO PC

early release with several shortcomings that the manufacturers have assured will be corrected in the final version. By that time, it is on the market, and hundreds of copies have been snapped up by the unwary public. Worse than that, many people have committed money and then find out that the product can't be shipped for many months.

I am glad that *PC*, unlike other computer magazines, does not publish product reviews that are written by the manufacturers of the same product. No matter how hard you try to point out to readers that these articles may not be objective, some will misunderstand.

I hope that *PC* will stay objective and continue to move fast. You could put consultants out of business.

Henry G. Moseley
Grafton, Vermont

Not a Bug at All

I'd like to respond to the article "Wising Up with KnowledgeMan" (*PC*, Volume 3 Number 4) and Ralph Freshour's letter ("Some Buggy Problems," *PC*, Volume 3 Number 13, page 95) regarding a serious bug that they say Micro Data Base Systems (MDBS) should have corrected. The bug referred to is "the one that adds an extra record when appending data."

We've been using *KMan* since shortly after the Las Vegas COMDEX last fall and find that the bug referred to is really a nice feature when understood properly. When you have added your last record and the cursor returns to the top adjacent to the record number, you merely press the Esc key to eliminate the extra record. The nice part about the feature is that when adding records that have the same fields (which happens frequently, such as the date or any other field that is the same as the last record), the information is already there and you just leave it there with CR. When the field is different, you merely type the new field. When starting to type in a field, the previous field is immediately deleted.

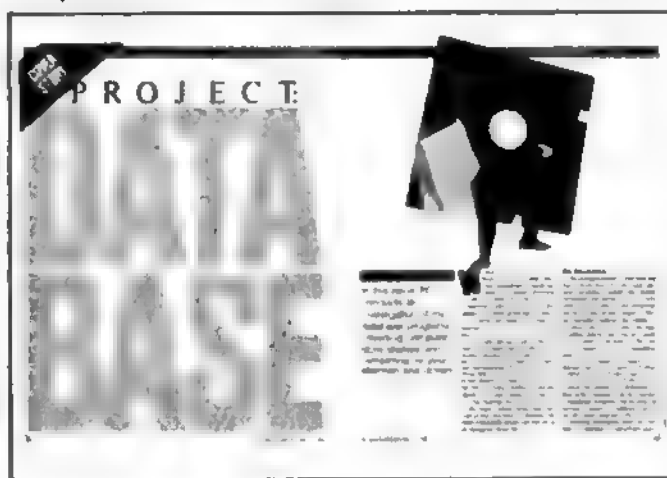
If this feature isn't wanted, all that needs to be done is set E.LMOD-FALSE.

Our experience with *KMan* puts it in a class all by itself. In my opinion, it is far superior to other Micro Data Base programs, as well as the big seller from Ashton-Tate.

M. Lee Osborne
Orange, California

Project: Success

I had been shopping around for a relational database program for 4 months before I came across "Project: Database" in *PC Magazine* (Volume 3 Numbers 11-17). I had heard so many conflicting stories



about databases that I didn't know where to turn to until I read your articles. I made a decision last week to purchase *R:BASE SERIES 4000* solely on the information you offered. I am extremely pleased with my purchase, and your description and review were right on target. I knew exactly what to expect, and the program delivers and performs as described with no surprises.

I do have one question. What does the term *procedural language* mean?

Ed King
Belleplain, New Jersey

A procedure-oriented language is a computer language designed to facilitate the accurate expression of procedures, algorithms, or routines belonging to a set of procedures. COBOL, FORTRAN, PL/I, and BASIC are all procedure-oriented languages.—Ed.

Your review of databases in "Project: Database" was great for those of us who are getting swamped by the multitude of software on the market. Please continue to do these general reviews—they are life-savers.

James P. Siepmann
Rochester, Minnesota

Congratulations on your extensive and comprehensive "Project: Database" series. I am not in the market for one now, but the series will be super for reference use, and for when I decide that I need something more than *PC-File*.

I would like to see *PC Magazine* extend this idea of in-depth analysis to other areas, such as financial software.

Lucius M. Lamar
Memphis, Tennessee

Look again! We've run many articles on financial software including the various Price Waterhouse Reports, "From Wall Street to Your Street," (PC, Volume 3 Number 13), "How to Be Your Own Best Financial Advisor" (Volume 3 Number 17), and many others.—Ed.

Good Language Support

I enjoyed your series of reviews of UNIX-like operating systems for the IBM PC (see *PC*, Volume 3 Numbers 10 and 11). As your articles noted, UNIX was originally an operating system designed by hackers for hackers. Imagine my surprise when I read through the tables and discovered that, besides C, almost no other language was listed. On larger computers, UNIX comes with BASIC, FORTRAN-77, LISP, Pascal, RATFOR, SNOBOL, and more. One of the nice features of AT&T's UNIX is that the code generator for the C compiler is used by both the FORTRAN-77 and Pascal parsers. So for just the cost of extra parsers, AT&T provides additional compilers. Only Co-Idris followed AT&T's example by providing a Pascal front end to the C compiler. *PC/IX* should be commended for providing BASIC and SNOBOL interpreters and a

from MicroComputer Accessories, Inc.

LOCK & ROLL.



It's here to stay. Our Rolltop 100 Disk File® with optional lock, holds 120 5¼" diskettes (twice the capacity of "flip top" files), in ten sections, with color coded divider labels. Anti-skid feet. Textured buff plastic body with your choice of bronze baked enamel or walnut rolltop. Also available in black with silver mylar rolltop. And 3½" microdiskette and 8" disk models. They're all lock & roll to you.

MicroComputer Accessories, Inc.

5721 Buckingham Parkway
P.O. Box 3725
Culver City, California 90231
Telephone 213/641-1800

In Europe:
N.V. Microcomputer Accessories Europe S.A.
Rue de Florence 37
1050 Bruxelles, Belgique
Telephone 02/538.61.73

These and other fine products are available at
Sears Business Systems Centers, Computer-
land, Businessland, IBM Product Centers and
other computer/software retail locations.



Computer Security Alarm



Flip-A-Turn



Keyboard Storage Drawer

MENU FOR YOUR EPSON

Now you can have full menu-based operation of all control functions of all of the Epson MX, FX and RX printers. **Printer Boss™** software lets you send all of the complicated control codes, in seconds, by making menu selections with a few simple keystrokes.

Select and deselect pica, elite, compressed, italic, enlarged, emphasized, doublestrike, underline, superscript and subscript for scores of different type faces. **Set** line spacing, right and left margins and skip-over-perforation. **Load** USA, France, Germany, England, Denmark, Sweden, Italy, Spain and Japan language sets. **Control** unidirectional, half-speed and proportionally-spaced printing. **Store and retrieve** 10 complete menu settings with a few keystrokes. Create ASCII files of data, corresponding to the stored menu settings, which can be accessed by or included in your own programs to set up the printer as required. **Emulate** the IBM-label printer for the IBM-PC, eliminating print-out problems with IBM-PC software and Epson FX printers. **Download** to FX printers five different **IBM character sets**, including graphics, screen and APL characters and greek symbols. Print two-pass **letter quality** on your FX at **full text-mode speed**, up to 10 times faster than with programs using graphics mode. Print multi-page **spreadsheets** as wide as you like, **sideways** on your paper, in a choice of five different type sizes. Or create a **printer buffer** of up to 32K. Ideal for **IBM graphics** software, or **screen dumps**, or printing text from **Wordstar**, **Lotus 123** or many other fine programs.

Printer Boss™ for the IBM-PC and compatibles \$59.95. With Letter Boss™ letter quality or Sidekick™ sideways print option \$99.95. With both \$139.95. Visa, MC, or send check. Free info. Dealers welcome.

Printer Boss™

CONNECTICUT SOFTWARE
30 WILSON AVENUE
ROWAYTON CT 06853
203-838-1844

SIDEKICK IS NOT TO BE CONFUSED WITH SIDEWAYS, A TRADEMARK OF FUNK SOFTWARE. PRINTER BOSS, LETTER BOSS AND SIDEKICK ARE TRADEMARKS OF SPEER RESEARCH CORPORATION. WORDSTAR AND LOTUS 123 ARE TRADEMARKS OF MICROPRO INT'L CORP AND LOTUS DEVELOPMENT CORP RESPECTIVELY.

FAST LETTER QUALITY FOR YOUR EPSON

Now you can print **letter quality** on your Epson FX printer at **full text-mode speed**, up to 10 times faster than with programs using graphics mode. **Printer Boss™** software gives you **two-pass dot-matrix letter quality** and lets you create a **printer buffer** of up to 32K. Or print multi-page **spreadsheets** as wide as you like, **sideways** on your paper, at high speed, in a choice of five different type sizes.

Printer Boss™ also allows full menu-based operation of all control functions of all of the Epson MX, FX and RX printers. **Select** and deselect pica, elite, compressed, italic, enlarged, emphasized, doublestrike, underline, superscript and subscript for scores of different faces. **Set** line spacing, right and left margins and skip-over-perforation. **Load** USA, France, Germany, England, Denmark, Sweden, Italy, Spain and Japan language sets. **Control** unidirectional, half-speed and proportionally-spaced printing. **Store and retrieve** 10 complete menu settings with a few keystrokes. **Emulate** the IBM-label printer for the IBM-PC while retaining full printer versatility. **Download** to FX printers five different **IBM character sets**, including graphics symbols, greek symbols, screen and APL characters. Print at full text-mode speed. Ideal for **IBM graphics** software, or **screen dumps**, or printing text from **Wordstar**, **Lotus 123** or many other fine programs.

Printer Boss™ for the IBM-PC and compatibles \$59.95. With Letter Boss™ letter quality or Sidekick™ sideways print option \$99.95. With both \$139.95. Visa, MC, or send check. Free info. Dealers welcome.

Printer Boss™

CONNECTICUT SOFTWARE
30 WILSON AVENUE
ROWAYTON CT 06853
203-838-1844

SIDEKICK IS NOT TO BE CONFUSED WITH SIDEWAYS, A TRADEMARK OF FUNK SOFTWARE. PRINTER BOSS, LETTER BOSS AND SIDEKICK ARE TRADEMARKS OF SPEER RESEARCH CORPORATION. WORDSTAR AND LOTUS 123 ARE TRADEMARKS OF MICROPRO INT'L CORP AND LOTUS DEVELOPMENT CORP RESPECTIVELY.

LETTERS TO PC

FORTRAN-77 set for release soon.

There are large markets that have made a significant investment already in languages other than C. Artificial intelligence has chosen LISP, engineering and scientific computation have chosen FORTRAN, and many students use Pascal. Many commercial products exist that are written in these languages. Yet on an IBM PC, MS-DOS is the only operating system that supports most of these languages. Here is a ready market just waiting for a viable multitasking operating system to come along with good language support.

Craig C. Douglas
New Haven, Connecticut

The Poetry of Software

Never before have I been so embarrassed while reading a magazine article. Not embarrassed for myself, mind you, but embarrassed for a history of feelings expressed through literature by poets such as John Donne. Yes, they are dead and the times they lived in are gone, but the nature of emotions and humanism that they expounded still continues. After reading Bill Machrone's article "New Product Love" (PC, Volume 3 Number 15), however, I have serious doubts whether this is still true.

My outrage stems not from the fact that he uses a poem as a basis for practical prose. Poetry is a precise way to express an idea, and analysis of the same is a good way to get a point across. But the simple fact is that Donne's "Lecture Upon The Shadow" never has, never will have, and never should have anything to do with software development and publishing in a serious sense. I first thought the article was going to be a humorous parallel by what can only be called a hokey and weak attempt to draw conclusions about software development from a poem of love and life. The fact that this article appears at all makes me wonder about the technological mindset of today. Is something beautiful from the past only worthwhile in terms of how it can be related (or misre-

LETTERS TO PC

lated) to today? Is love really a software package?

Next thing you know, computer science classes will be given roses to dissect with each petal relating to the stem like chips in a motherboard.

Rob Southall
Prairie Village, Kansas

Finally! An editor who seems to have read something other than the technical reference manual. There is still hope for the world. Keep up the good work.

William Burt
Union, New Jersey

True Tests

I thoroughly enjoyed Howard Karten's article "Stress Test for Floppies" (PC, Volume 3 Number 13). I was disappointed, however, that Karten did not report the results of the test shown in the picture—the data compression test (the hammer test)—or the menu technique (the lasagna test).

James E. Manley
Baltimore, Maryland

We were disappointed too, so we decided to duplicate the tests. The results for the hammer test were smashing. The force of a hammer swung from a 90° angle (wrist straight up) destroys a diskette 98.3% of the time (98.8% for health club members).



The menu technique yielded one sure principle: lasagna is not improved by using a diskette as a spatula. Our food and wine editor remarked, "Now that's not Italian."—Ed.



(Formerly Warehouse Software)

Call for programs not listed.

Technical & Other Information (602) 246-2222
TOLL-FREE ORDER LINE 1-(800) 421-3135

WE ♥ YOU!

For making us one of the fastest growing microcomputer product suppliers in the country. In appreciation, for the next few weeks we are offering a program diskette for the IBM PC at no charge to anyone who makes a purchase of \$125 or more. Included are programs to print labels, balance your checkbook, select printer type fonts, do loan depreciation, word processing, plus 49 others. We hope that you will like these programs so much that maybe you will ♥ us too.

DATA BASE MANAGEMENT SYSTEMS

Fox and Geller Quickcode	\$159
KnowledgeMan	\$275
Condor III	\$320
NWA Statpak Special	\$285
Tim IV	\$249
Infostar	\$249
PFS File	\$95
FRIDAY	\$165
Personal Pearl	\$215
Fast Facts for IBM PC	\$135
RBase 4000	\$269
CLOUT	\$119

WORD PROCESSING

Wordstar, Mail Merge, Correct	Call
Star, Star Index, Special	Call
Wordstar	\$130
Mail Merge or Correct Star	\$284
Microsoft Word With Mouse	\$248
Word Perfect	\$110
Volkswriter for the IBM PC	\$155
Volkswriter DeLuxe	\$38
Wang Spellchecker	\$249
Multimate	\$185
Peachtext 5000	\$89

SPREADSHEETS

Calstar	\$145
Supercalc II	\$195
Supercalc III	\$119
Microsoft Multiplan	\$259
ITK Solver	\$259

ACCOUNTING

TCS, equivalent of Peachtree Specialty, augmented by Warehouse Software. Customized for your IBM PC Terminal and Printer - GL, AR, PA, AP, CP/M-80, CP/M-86 for PC, XT, DOS 1.1, 2.0	Each Module \$75 For All Four \$275
--	-------------------------------------

CYMA	Call
Dollars & Sense	\$95
MBSI, Real World, GL, PA, AP, AR	\$350
Each Module	\$350

TRANSFER PROGRAMS

Move-it	\$78
Microstuff Crosstalk	\$95
Hayes Smartcom	\$88

MULTIFUNCTION BOARD FOR IBM PC OR COMPATIBLE	
Multifunction Board includes Async Adapter, Parallel Adapter, Clock with battery back-up and Software, 64K memory expandable to 512K, 1 year warranty	\$249

LANGUAGES

Lifeboat Lattice C Compiler	\$295
Microsoft C Compiler	\$315
Microsoft Pascal Compiler	\$215
Microsoft Basic Compiler	\$245
Microsoft Basic Language	\$235
CBASIC 86 for IBM PC (CP/M-86)	\$135

FOR PC DOS

Norton Utilities	\$48
Copy II PC	\$34
Prokey V3.0	\$79
Harvard Project Manager	\$225
Microsoft Flight Simulator	\$32

HARDWARE

Hayes 1200 Modem	\$485
Hayes 1200b Modem for IBM PC	\$415
Internal Modem for IBM PC 1200 Baud	\$285
Anchor Signalman 1200baud Modem	\$260
CDC 360K Disk Drives	\$199
1/2 Height Panasonic Drives D/S D/D	\$185
10MB Datamag Hard Drive for IBM PC	\$995
33MB External Hard Drive for IBM PC	\$1795
Princeton RGB Monitor	\$469
Taxan RGB Vision 420	\$425
Sweet Pea Plotter	\$795
64K RAM 150 Nsec.	\$48

COMPUTERS

Corona Computers	Call
All new Televideo Portable—99.9% IBM PC Compatible —	\$1795

BOARDS FOR THE IBM PC OR LOOKALIKES

AST Six Pack with 64K	\$285
Quadram Color I	\$185
Quadram Color II	\$225
Plantronics Color+	\$365
256K Sigma Ram Board	\$299
Maynard Sandstar Controller	\$195
Tecmar Graphics Master	\$485
STB Graphics II	\$350
New Quad Board Multifunction	\$235

PRINTERS

Gemini 10X	\$265
Gemini 15X	\$365
Toshiba	Call
Okidata 84P	\$865
Okidata 92P	\$399
Okidata 93P	\$599
Juki 6100	\$409
Call on all Epson Models	
Daisywriter 2000	\$980
C.I.TOH 55 CPS & 25 CPS	Call
Diablo 630	Call
NEC 3550	Call

TERMS: Prices include 3 to 5% cash discount. Charge orders are 3 to 5% higher. Shipping on most items \$3.00. AZ orders +6% Sales Tax. Prices subject to change.

TOLL-FREE ORDER LINE 1-(800)-421-3135



2701 West Glendale Ave., Suite 6
Phoenix, AZ 85021



Softline

FOR YOUR BOTTOM LINE.

Lotus 1-2-3 \$309	dBase III \$CALL	WordStar Professional \$359	MultiMate \$269
----------------------------------	-----------------------------	--	----------------------------

WORD PROCESSING/ EDITORS

Easywriter II System (3 pak)	\$219
Fancy Font	\$159
Final Word	\$189
Microsoft Word	\$239
Microsoft Word/Mouse	\$299
Multimate	\$269
PeachText 5000	\$219
PFS Write	\$ 95
Volkswriter Deluxe	\$169
The Word Plus (Oasis)	\$109
Word Perfect (SSI)	\$Cali
WordPlus PC with The Boss	\$319
WordStar	\$239
WordStar Professional (WS-MM-SS-SI)	\$359
WordStar Options Pak (MM-SS-SI)	\$189
XYWrite II+	\$229

SPREADSHEETS/ INTEGRATED PACKAGES

Electric Desk	\$Cali
Framework	\$Cali
InteCalc	\$189
Jack 2	\$329
Lotus 1-2-3	\$309
Multiplan	\$135
Open Access	\$379
Ovation	\$Cali
Smart System	\$579
SuperCalc 3	\$239
Symphony	\$Cali
TKI Solver	\$269
VisiCalc IV	\$159

PROJECT MANAGEMENT

Harvard Project Manager	\$239
IntePert/Plan	\$239
Scholar Project Scheduler	\$229
VisiSchedule	\$199

LANGUAGES/UTILITIES

Concurrent w/Windows	\$219
Digital Research C Compiler	\$219
Lattice C	\$309
Microsoft C Compiler	\$329
MS Basic Compiler	\$249
MS Fortran	\$239
Norton Utilities	\$ 59

COMMUNICATIONS/ PRODUCTIVITY TOOLS

Crosstalk	\$119
Memory Shift	\$ 79
Move It	\$109
Prokey 3.0	\$ 95
Relay	\$ 99
Smartcom II	\$109

GRAPHICS/STATISTICS

Abstat	\$279
BPS Business Graphics	\$229
Chartman Combo (II&IV)	\$349
Chartmaster	\$259
dGraph	\$189
DR Draw	\$199
Energraphics w/Plotter	\$319
Execuvision	\$279
Fast Graphs	\$219
Graphwriter Combo	\$399
PC Draw	\$279
PFS Graph	\$ 95
Statpac NWA	\$329
Statpac Walonick	\$299

ACCOUNTING MODULES

Ask Micro Accounting	\$299
BPI Accounting	\$369
IUS EasyBusiness System	\$319
MBA Accounting	\$369
Open Systems Accounting	\$459
Peachpak 4 (GL/AP/AR)	\$239
Peachtree Accounting	\$399
Real World Accounting	\$469
Star Accounting Partner (GL/AP/AR/PAY)	\$269

DATABASE SYSTEMS

Alpha Data Base Manager II	\$179
Condor III	\$329
dBase II	\$289
DBplus	\$ 89
Friday	\$179
InfoStar	\$269
KnowledgeMan	\$299
PFS File PFS Report	\$169
Powerbase	\$269
QuickCode	\$169
R base 4000	\$279
TIM IV	\$269
Versaform	\$249

PROFESSIONAL DEVELOPMENT

Management Edge	\$169
Think Tank	\$129

HOME/PERSONAL FINANCE

Dollars and Sense	\$119
Financier II	\$119
Home Accountant Plus	\$ 99
Sundex CPA	\$109
Tax Preparer 84	\$189

HARDWARE PERIPHERALS*

AST Six Pack Plus (64k)	\$269
Quadboard (OK)	\$Cali
Hayes 1200B with Smartcom	\$399
Hayes Smartmodem 1200	\$499
Keytronic 5151 DLX	\$209
IRMA	\$995
Hercules Graphics Board	\$349
Epson FX 100 Printer	\$Cali
Comrex II Printer	\$Cali
C Itoh Prowriter	\$Cali
C Itoh Starwriter	\$1199
Okidata 93A	\$749
64K Memory	\$ 55

*Call for shipping

LETTERS TO PC

Love It and Learn

I read Alan Hoenig's review of Microsoft's *Word 1.1* in PC News (PC, Volume 3 Number 16, page 60). I would like to add a few comments to his.

I have found *Word* to be very difficult to learn, but it is very powerful once you have learned to use it. I still am unable to use many of the commands, and I expect that it will take me about another 6 months to learn all the features.

I would suggest that prospective buyers take the time to try out the package thoroughly. Although I had to struggle to learn and apply *Word*, I believe that someday, somehow, I will master it. Then, I will have a really powerful tool.

Robert J. Hobbs
Upland, California

Corrections:

In line 40 of the second program listing in PC Tutor ("PEEKing at Ports," PC, Volume 3 Number 17, page 394), the final equal sign should be a plus sign. This is the corrected line:

40 STATUSA% = &h80 AND INP
(1+PORT%)

"The Hidden Character Set on IBM's Color Card" (blurb on cover of Volume 3 Number 19) was hidden, all right, more so than we intended. As you may already have noticed, the article actually appears as "A Character Set for a More Readable Screen" in this issue. Sorry.

How to Write to PC

Do you have a comment, compliment, or criticism about something you read in PC? A question you'd like to open up to other readers? Send it to "Letters to PC," PC Magazine, One Park Avenue, New York, NY 10016. We are not able to answer letters personally.

All letters become property of PC Magazine and may be subject to editing. We cannot print letters that do not include a name and address.

R: base 4000 \$279	Volkswriter DLX \$169	AST 6 Pak Plus \$269	Smartmodem 1200B \$399
-----------------------------------	--------------------------------------	-------------------------------------	---------------------------------------

free!

Diskette
Library
Case
with your order



DISCOUNT COUPONS

With each order,
we offer
discount coupons
worth up to
\$10 on your next order.

1-800-221-1260

In New York State call (212) 438-6057

TERMS:
Checks, allow 14 days to clear. Credit
processing add 3%. C.O.D. orders cash M.O.
prepaid. Add \$3.00 shipping and
handling. UPS surface add \$3.00 per item.
UPS Drive \$6.00 per item. NY State
has depts. and applicable sales tax. All prices
subject to change.

Softline

Softline Corporation
P.O. Box 729, Brooklyn, NY 11230
TELEX 421047 ATLN UI



ORDER NOW AND SAVE!

**SUBSCRIBE TO PC
AND SAVE UP TO 26%**
Enter your subscription to PC, the magazine for your IBM PC, and save up to 26% off our already low subscription price! Every other week PC brings you the latest advances, trends, and information on software, peripherals, applications and new program ideas.



YES, ENTER MY SUBSCRIPTION TO PC FOR:

- ☐ 20 issues \$21.97. **SAVE 18%**
☐ 40 issues \$39.97. **SAVE 26%**

Savings based on full one-year subscription price of \$34.97.

CHECK ONE: ☐ Payment enclosed ☐ Bill me later
Charge my: ☐ American Express ☐ Visa ☐ MasterCard

Card No. _____ Exp. Date _____ PC 4S523

Mr./Mrs./Ms. _____ (print name in full)

Company _____

Address _____

City _____ State _____ Zip _____

Please add \$2 an issue for Canada and all other foreign countries.

DISCOUNT
ORDER CARD

SAVE UP TO 26%!

**GIVE A GIFT TO A
FRIEND AND SAVE!**
Now that you will be enjoying hundreds of colorful and fact-filled pages of PC, month after month, why not share your good fortune (instead of your copy) with a friend! Fill out the attached discount gift card and mail it in today!



YES, ENTER MY SUBSCRIPTION TO PC FOR:

- ☐ 20 issues \$21.97. **SAVE 18%**
☐ 40 issues \$39.97. **SAVE 26%**

Savings based on full one-year subscription price of \$34.97.

CHECK ONE: ☐ Payment enclosed ☐ Bill me later
Charge my: ☐ American Express ☐ Visa ☐ MasterCard

Card No. _____ Exp. Date _____ PC 4S523

Mr / Mrs / Ms _____ (print name in full)

Company _____

Address _____

City _____ State _____ Zip _____

Please add \$2 an issue for Canada and all other foreign countries.

DISCOUNT
GIFT CARD

GIVE A GIFT TO A FRIEND!



YES, ENTER A SUBSCRIPTION FOR A FRIEND!

- ☐ 20 issues \$21.97. **SAVE 18%**
☐ 40 issues \$39.97. **SAVE 26%**

Savings based on full one-year subscription price of \$34.97.

SEND GIFT TO:

Name _____

Address _____

City _____

State _____ Zip _____

Gift card to read from _____

CHECK ONE: ☐ Payment enclosed ☐ Bill me later
Charge my: ☐ American Express ☐ Visa ☐ MasterCard

Card No. _____ Exp. Date _____

Please add \$2 an issue for Canada and all other foreign countries.

FROM:

Name _____ PC 4S523

Address _____

City _____

State _____ Zip _____



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 66 BOULDER, CO.

POSTAGE WILL BE PAID BY ADDRESSEE



P.O. Box 2443
Boulder, Colorado 80321



SUBSCRIBE
TODAY!

Don't turn
your back
on the facts...



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 66 BOULDER, CO.

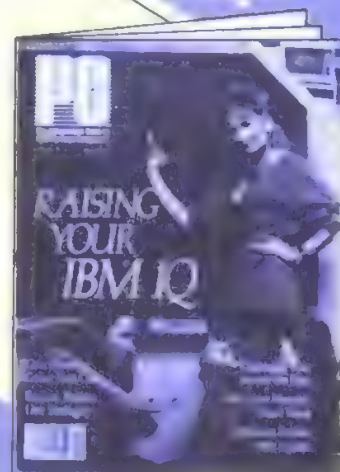
POSTAGE WILL BE PAID BY ADDRESSEE



P.O. Box 2443
Boulder, Colorado 80321



SUBSCRIBE
TODAY!



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 66 BOULDER, CO.

POSTAGE WILL BE PAID BY ADDRESSEE

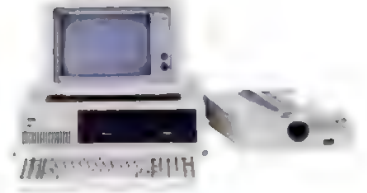


P.O. Box 2443
Boulder, Colorado 80321

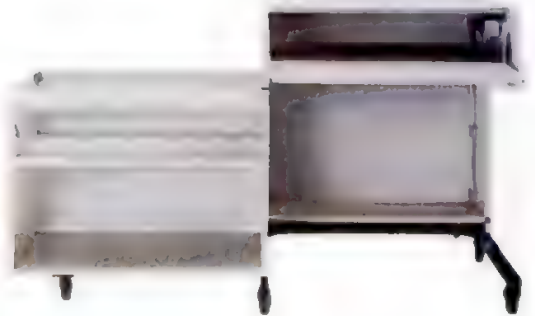


SUBSCRIBE
TODAY!

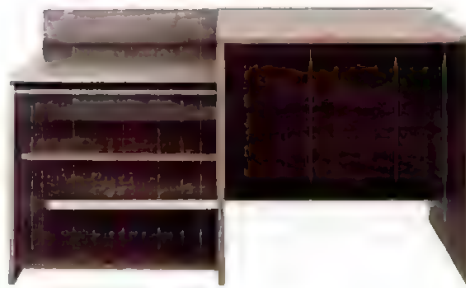
One good idea



deserves another



and another



and

another.



At IBM, we've been working to help your business keep up with its computer needs.

That's why we developed our innovative line of IBM Personal Computer Furniture. You'll find work stations, tables and chairs that are custom-designed to accommodate Personal Computers, as well as the people who use them.

And best of all, you'll find IBM's PC Furniture available in a variety of prices designed to accommodate your budget.

The IBM Synergetix® PC Work Station (pictured in pearl white) provides a convenient and compact workspace for the Personal Computer. In addition, it's completely mobile, so you can move it from office to office. But most important, the entire unit closes and locks, so you can secure and protect your system.

The IBM PC Table (pictured in walnut) is a stationary unit that's economically priced. It has the same durable construction as our PC Work Station, along with some basic security features. What's more, it's also perfect for the IBM PCjr.

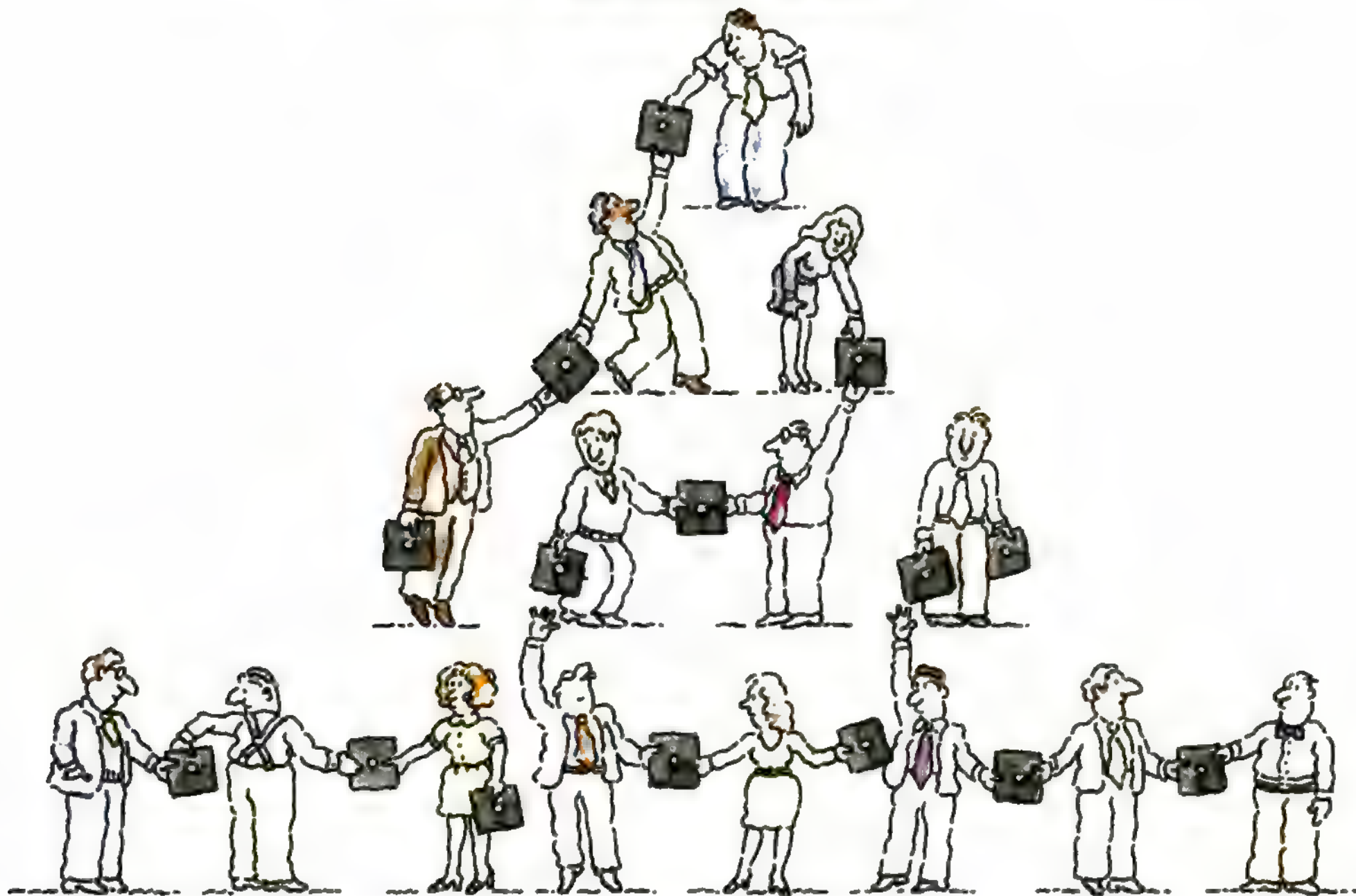
The IBM PC Chair boasts a price tag you don't have to sit down for. This ergonomically engineered seating comes equipped with fingertip adjustments and features a contoured backrest for greater comfort and support.

You'll find our IBM PC Furniture in a variety of attractive colors at your IBM Product Center. The IBM PC Work Station is also available at participating retailers. To find out the location nearest you or to order by phone, call *IBM Direct* toll free at 1 800 IBM-2468, ext. 522.

IBM Personal Computer Furniture. It's designed with you and your PC in mind.



THE END OF SOFTWARE FREEBIES.



Finally there's a foolproof way to protect software against unauthorized duplication. And the technology is all on the disk itself.

The new Prolok™ disk doesn't need add-on hardware. Instead each diskette is marked with a unique, physical "fingerprint." No two are alike. A precise description of the individual print is encoded magnetically. The fingerprint AND the description must match exactly before the software is decrypted and released to the system. No match, no access.

Its genius is its simplicity and familiarity. Prolok looks like an unprotected disk, loads like an unprotected disk, works like an unprotected disk. The user feels immediately at home and in command. It's as easy as A>PROLOK B: filename.

Backups are easily made via normal system utilities. However, to be read they must be accompanied in the system by the original Prolok disk.

Prolok puts the casual copier—and even the deliberate pirate—out of business. It barely

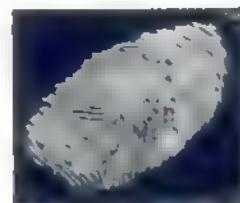
increases the price of your product, yet it makes sure your customers don't buy one program and copy ten.

Several command line slash (/) options are built into Prolok diskettes for customized security, depending on your needs.

Software can be loaded easily onto Prolok diskettes using any system from a PC to commercial mass duplication equipment.

Prolok is an engineering breakthrough of Vault Corporation, which has been successfully safeguarding software since the inception of security disk technology. Over 2000 businesses and organizations protect their valuable programs with Prolok.

Simply contact Vault Corporation at 2649 Townsgate Road, Suite 500, Westlake Village, CA 91361. Or phone us at 800-445-0193 (U.S.) or 800-821-8638 (California). And find out why software freebies are becoming a thing of the past.



PROLOK. SOFTWARE PROTECTION, RIGHT ON THE DISK.

Copyright © 1984 Vault Corporation. Prolok is a trademark of Vault CorporationCIRCLE 508 ON READER SERVICE CARD

The Dissection of DOS 3.0

DOS 3.0 is 50 percent larger than its predecessors and eats up 20K more memory than DOS 2.1. It also lacks "dot comments," which made batch files prettier and more efficient.

With DOS 3.0 out, it's time for another edition of "The DOS Report." Thanks to my article "The Dark Side of PC-DOS 2.0" (*PC*, Volume 2 Number 2), some readers expect me to trash all new releases. Honest, folks, that's neither my style nor my purpose. My goal is to point out some of the lesser-known characteristics of each version of DOS—both the bad and the good ones. With this purpose in mind, let's look at the latest DOS.

DOS 3.0 is 50 percent larger than its predecessors. The resident part of DOS—that is, two hidden files on the DOS disk named `IBMBIO.COM` and `IBMDOS.COM`—is 15K, or 70 percent bigger; when I add in the command interpreter, `COMMAND.COM`, I get another 5K increase, for a total of 20K, which is a 50 percent increase over the three program files that make up the core of DOS 3.0. Thus DOS 3.0 eats up 20K more memory than DOS 2.1. If your PC is loaded with memory, that's small potatoes, but if you don't have at least 128K RAM, then DOS 3.0 is not for you.

Now, let me mention two resident programs, `PRINT` and `SHARE`, that you can install into DOS. `PRINT` came with the introduction of DOS 2.0, while `SHARE` is new to DOS 3.0. To install them, you simply invoke them, but unlike most programs, these two load into memory and

then stay there to do their work while you perform other tasks with the computer. Each program occupies 5K RAM when loaded, so keep that in mind when you are determining how much memory you



Peter Norton

need for your operating system.

How much memory can be eaten up with the operating system and its extensions? Let's look at my system as an example. Giving DOS 3.0 32 disk buffers (with `CONFIG.SYS`), running it with `SHARE` (without `PRINT` or `VDISK`), and using two popular resident programs—*ProKey* (default size) and *SideKick* (without the notepad)—I've eaten up a cool 100K RAM.

In the past, everything in DOS had a version number to match the OS. No

more. For example, the `LINK` program has a version number of 2.2, but it was introduced with Version 2 of the IBM Pascal compiler. `DEBUG` and `EXE2BIN` are each marked as Version 2.4, but I think that 4 is just a Microsoft reference rather than IBM's official version number. Other stuff, such as `BASIC`, has the 3.0 version number, just as expected.

No More Dots

A wonderful, undocumented feature of batch files that has evolved into widespread use is "dot comments." Of course, `REM` is the officially approved way of putting comments in a batch file, but, as I learned from Andy Fluegelman, the use of a period, instead of the keyword `REM`, worked as a better type of batch-file comment. First, the dots are nicer and less obtrusive on screen than the `REMs`. And more importantly, DOS doesn't insert blank lines between successive dot comments as it does for `REMs`, making possible neatly formatted comments on the screen.

Although undocumented and unannounced, dot comments have been a feature of DOS Versions 1.0 through 2.1. Now, they are gone. All those who use dot comments will now find that DOS objects to the dots with the remark "Bad command or file name."

Another feature of DOS 2.0 that has

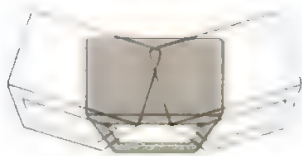


Until now your PC was missing an essential piece. **Master Piece.**TM

Introducing the only accessory your IBM® PC will ever need. The Master Piece is four accessories in one, offering your PC the protection and convenience it's been missing.

SEE EYE TO EYE WITH YOUR IBM PC.

The Master Piece provides a swivel for your monitor. This swivel lets you adjust the viewing angle of your monitor with just the touch of a finger.



PUTS YOUR ENTIRE SYSTEM AT YOUR FINGERTIPS.

Stop fumbling with cords and scrambling for outlets to plug in your peripherals. Stop lunging to the other side of the room just to turn on your printer. The Master Piece functions

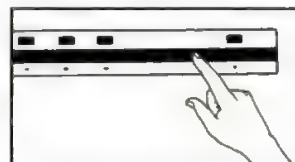
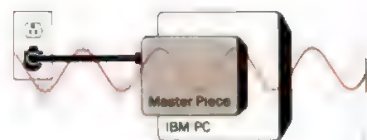
as a five outlet power strip to organize all your power needs. Power up with the master switch, then use the individual switches to control your peripherals. Touch the master switch to shut down and the Master Piece makes sure you never accidentally leave your peripherals running overnight.



POWER LINE PROBLEMS ARE NO PROBLEM.

Surges, spikes and line noise are responsible for 70-90% of PC malfunctions. They can wipe out memory in your PC, taking hours of hard work with them. That just costs you time. Even worse, they can zap your delicate chips, sending your PC in for repairs. That costs you money.

The Master Piece stops power line problems dead. You end up with an IBM that's more accurate and more reliable.



EVEN YOU ARE A THREAT TO YOUR IBM PC.

During the course of an active day, you build up static electricity—just as much a threat as surges and spikes. Until now, the

only solutions to static were unsightly floor mats or pads that fit under your computer. The Master Piece offers an elegant alternative. Just touch its nameplate before you begin work and all static charges are safely grounded.

Master Piece, the most versatile, most convenient, most useful peripheral ever made for the IBM. In fact, you'll come to think of it as the piece your PC was missing.

\$139.95 at computer stores everywhere.



251 Park Avenue South, New York, NY 10010, (212) 475-5200, Telex: 467383 KML NY.

CIRCLE 275 ON READER SERVICE CARD

disappeared in DOS 3.0 is SWITCHAR control. As you know, DOS uses the slash character (/) for "switches" or program options and the reverse slash (\) for specifying directories in file paths. However, the UNIX operating system—which DOS is evolving toward—uses a hyphen (-) to identify switches and the slash (/) for directories. A little-known feature of DOS 2.0 allows you to change the standard character for switches from a reverse slash (\) to any other character by redefining it with SWITCHAR in your CONFIG.SYS file.

DOS will report what the switch character is to any program that asks because it's the program's job, not DOS's, to make sense out of the command line that follows a program name—and that includes making the distinction between program parameters and program switches. Some programs do things right: They ask DOS what the switch character is and act accordingly. Others always assume it's a slash, which is the DOS convention; and a few, such as the Mark Williams C compiler, assume that it's a hyphen, the UNIX convention.

Anyway, you could control the switch character in DOS 2.0, but you can't in DOS 3.0. Maybe it's a good change. After all, switch characters ought to be standard, and, by taking away the option, DOS is enforcing its own standard.

Gains and Losses

In DOS 2.0, the switch character was controlled in a parameter of the CONFIG.SYS file. By looking into what DOS 2.0 and DOS 3.0 will check for in the CONFIG.SYS file, I've discovered several additions and deletions in the transition from DOS 2.1 to 3.0. Lost are SWITCHAR, which I've already mentioned, and AVAILDEV. Gained are STRING, FCBS, LASTDRIVE, and COUNTRY. Like BUFFERS and FILES, FCBS and LASTDRIVE let you control how much memory DOS eats up for some tables. For most of us, that's inconsequential, but it does help if you are

fine-tuning your memory use. COUNTRY, of course, controls the country-dependent items, such as date format, number punctuation, and currency symbol. If you want details, see the SELECT command or DOS function call 38.

Two New Commands

Two new commands are LABEL and ATTRIB, both of which make obsolete small parts of my *Norton Utilities*. It's good news when DOS eliminates the usefulness of some of my programs, instead of creating the need for more.

Now for the good news and the bad news about LABEL and ATTRIB. The good news on LABEL is that it works on any disk, including hard disks. The bad news is that LABEL will claim that some disks can't accommodate a volume ID label when they actually can. The good news on ATTRIB is that it lets you control the read-only attribute, which protects files against being changed or deleted. We've needed this ability from the first introduction of the read-only attribute with DOS 2.0. The bad news is that ATTRIB won't let you change the archive attribute. Archive is used to tell the BACKUP program which files have been changed since the last backup copy. This archive attribute is a key to the successful support of a hard disk. The concept is to cut the time-consuming task of continually making complete copies of your hard disk. Now, you make a complete copy only every so often, and in between, you make incremental backups of the files that have been changed.

DOS Misses the Ball

Whenever you create or change a file, DOS sets the archive bit, letting BACKUP know that the file has been changed when you ask for an incremental backup. That's all very good, but you need to have some manual control over the archive attribute so you can control things to force a backup of files when you want it (even if they haven't been changed) or avoid a backup of files that don't matter.

Therefore, the ATTRIB program ought to let us control the archive attribute as well as the read-only attribute. Unfortunately, it doesn't. However, *The Norton Utilities* let you control the archive

The system I'm
writing this on
has three drives.
But DOS 3.0
claims I have five.

attribute on floppy disks, and the next edition will support it for any disk. Whenever DOS misses the ball, I try to run with it.

There are a number of other idiosyncrasies that I've found in DOS. One is that when a program starts up, DOS reports a number of important things to it, such as how much memory can be used, placing the information in a program header known as the PSP. Surprise: DOS 3.0 reports it differently than DOS 2.0. As near as I can tell, DOS 3.0 does it right and DOS 2.0 does it wrong—in a way that could cause a program's stack to be clobbered and crash. Any program that relied on DOS 2.0's way of reporting this could be in for trouble.

Another area of interest is the DOS service that reports on the number of disk drives. Smart programs use this information to learn what's what. Unfortunately, DOS 3.0 reports the wrong number. For example, the system I'm writing this on has three drives, A: through C:. But DOS 3.0 claims I have five drives, A: through E:. I can't use the spurious drives, of course, but DOS claims I have them. If you're using *Framework* with DOS 3.0, you'll see frames for drives A: through E.; anything that appears after your last true drive is just DOS nonsense.

There is more to tell of the oddities of DOS 3.0, but what you've seen so far will give you a taste of what's there. ■

COVER YOUR TAIL!

Are you unnecessarily exposed? Could you accidentally format your hard disk or copy over valuable data for which you have no backup? Are you working with national security or client data which must not be compromised? Do you have valuable corporate plans and records that you want to keep confidential?

Systemate, the **SOFTWARE INTEGRATION AND SECURITY SYSTEM**, offers a comprehensive set of security tools that span user needs from the home user through the largest corporate user. Features that will help you prevent security abuses, include:

- **Authorization Codes:** Authorization codes can be required to authorize changes to Systemate menus.
- **User Access Codes:** Systemate can be set up so that at "sign on" a user number and user code are required.
- **Passwords:** Any menu item can be protected with its unique password. Thus, users have the ability to set up virtually any type of hierarchical password system, limited only by need and creativity.
- **Program/Subsystem Lock:** Systemate uniquely allows you to lock programs and data so that they can only be accessed through Systemate. Users cannot circumvent the security system by using their knowledge of DOS, because the Systemate Security locks prevent



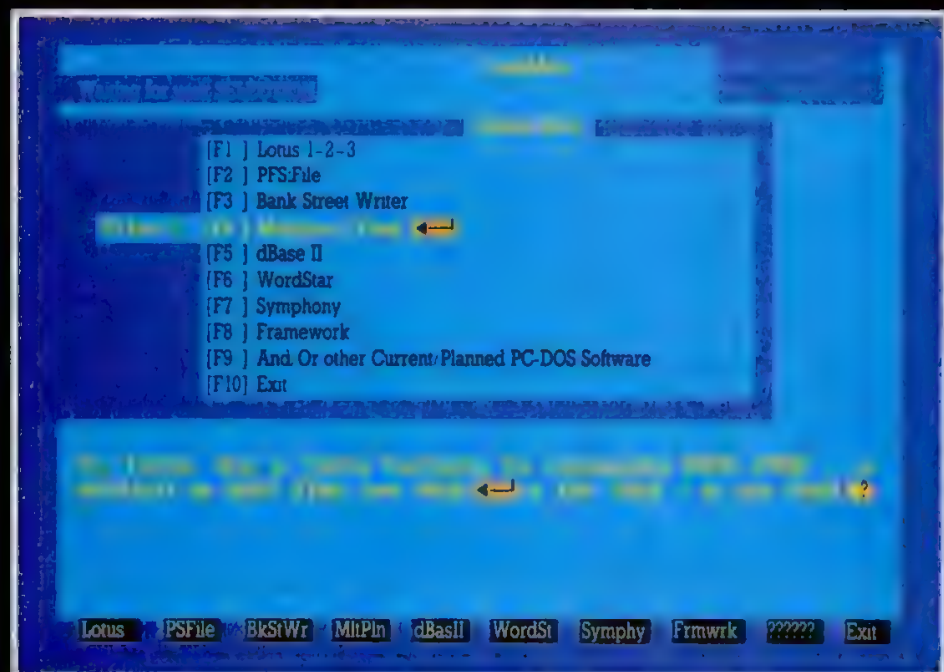
access through DOS.

One way to cover your tail: On a hard disk system, you could set up a menu item to format diskettes on drive A: and require an authorization code so that the format menu item could not be altered without credentials. You could also require a password in order to execute that format menu item. You could then lock the format program so that it could not be used directly with DOS; users would have to go through Systemate to format diskettes. With that implementation, it would be virtually impossible to format your hard disk, unless you unlock the format program. Other similar errors or problems can be prevented by using these Systemate techniques and methodologies.

And Systemate is much more than just a security system. We call it Systemate, because that is what it does — it mates software and hardware together into an **INTEGRATED SYSTEM**. The system virtually eliminates the need to know and understand PC-DOS. It is very easy to install and operate, with superb documentation.

FEATURES: System security components, diskette labeling, label checks before mounting, definable screen prompts for training, pre and post execution instructions, and it allows Lotus and your wordprocessor, and/or any other combination of applications, to access common data files. It will operate on diskette, hard disk or ultra high speed RAM disk systems, color or monochrome.

So Cover Your Tail with a Systemate order today!



47⁰⁰
Suggested Retail Price:
Add \$5.00 per order for
shipping and handling.

Systemate, Inc.

TWIN TOWERS EAST
MARKETING SUITE 200
1106 CLAYTON LANE
AUSTIN, TEXAS 78723-1033
(512) 458-6202

ORDER TOLL FREE "24 HOURS/DAY"

1-800-824-7888-OPERATOR 806
In Alaska/Hawaii 1-800-824-7919
(MC, VISA, OR C.O.D.)

DEALER/DISTRIBUTOR INQUIRIES
WELCOME

LOTUS[®] and Symphony[®] are trademarks of Lotus Development Corp.
WordStar[®] is a trademark of MicroPro International Corp.
Bank Street Writer[®] is a trademark of Broderbund Software, Inc.

dBase[®] and Framework[®] are trademarks of Ashton-Tate.
Multiplan[®] is a trademark of Microsoft.

Systemate[®] is a trademark of Systemate, Incorporated.
PFS File[®] is a trademark of Software Publishing Corporation.

CIRCLE 461 ON READER SERVICE CARD

Copyrighted material

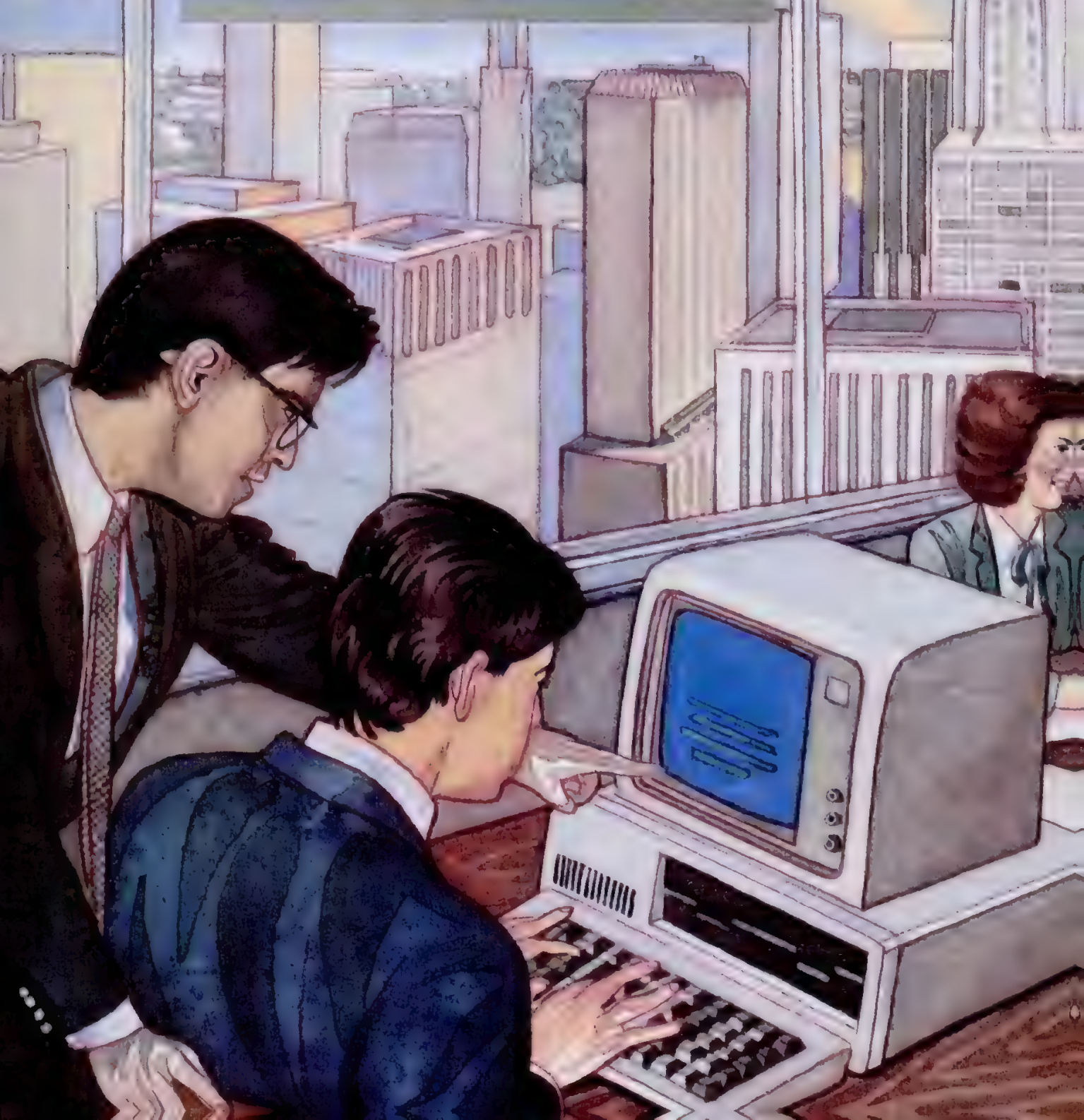


COVER STORY • KEN EDWARDS

PROJECT MANAGEMENT WITH THE PC

THIRTY-FOUR SOFTWARE PACKAGES FOR THE PC CAN HELP YOU PLAN, SCHEDULE, AND CONTROL LARGE-SCALE PROJECTS. THEY ENLIST THE AID OF YOUR COMPUTER FOR SUCH TASKS AS LOOKING UP CALENDAR DATES, TOTALING BUDGETS, DRAWING CHARTS, AND FINDING CRITICAL PATHS. THIS THREE-PART SERIES WILL EXAMINE EACH OF THE THIRTY-FOUR PACKAGES, STARTING WITH LEVEL I PROJECT PLANNING SOFTWARE.

Anyone who has watched a NASA space launch has observed the intricate scheduling of tasks, built-in checkpoints, and coordination that is necessary for an effort of that magnitude. To accomplish such a massive undertaking requires not only great technological skill but also great management skill. In fact, most of the techniques used by project managers today had their ori-







PROJECT MANAGEMENT

gins in military and space programs.

Formerly, project managers who sought computerized assistance for scheduling and carrying out their tasks had no option other than to use mainframes and minicomputers. Now, however, project management software is becoming widely available for the PC. To help you determine whether you should use a formal automated tool to manage your projects, we have prepared a checklist of questions you can answer quickly (see sidebar, "Do You Need Project Management Software?"). If you check more than two boxes you should consider using a project management system; if you check five or more, you probably need this software. Almost everyone at some time has managed a project and has had to plan, schedule, and then direct or control the work of others so that they achieved specific objectives. If you're one of those people, you probably already realize how important a project management tool can be.

PLANNING YOUR WORK

Most of us have heard the old adage "plan your work and work your plan," but exactly how *do* you plan your work?

Do you make a "to do" list? Do you draw up a list for each person with target dates for the completion of each task? Do you draw a Gantt chart (see sidebar, "A Project Management Glossary") of tasks against time to show task schedules and project milestones? Do you use PERT charts, and, if so, how often do you update them and how long does it take you? You're probably beginning to get the idea: A computer can perform many of the mechanics of looking up calendar dates, drawing charts, summing up budget amounts, and determining a critical path.

Until recently, project management was either a time-consuming manual task or the domain of those with access to mainframe computers that supported comprehensive (and often complex) software products. When the personal computer arrived, it wasn't too long before elements of project management appeared. While you were mastering a spreadsheet program, a word processor, and maybe a database program, project management on a personal computer was still in its infancy. Software designed for this purpose lacked sophistication, and many critics

rejected them outright as trivial attempts at creating complicated software.

But recently project management software has matured to a point that could cause a market explosion. The next NASA launch may not be managed on an IBM PC, but the sophistication of these products should give you an incentive to try your hand at improving the management of what you do.

Before you jump at the opportunity, however, you should reflect on your needs and your personality. Most people find that either they're terrible planners and organizers or they're much better than average. The tendency of super planners is to outline projects in excruciating detail. The less energetic planner tends to gloss over the details and then sum them together as macro tasks. In either case, you need to accommodate your style to have a successful undertaking with this software.

What next? The casual observer might go into his or her local computer store, ask about project management software, and perhaps find a couple of representative products for the PC. But how many products are there competing in this marketplace, and which ones will best suit your needs?

The survey we completed for this article turned up 35 DOS-compatible project management software packages. You may be surprised by this number, thinking as we did that there were only about 10 to 15 products in this category. To evaluate so many products was a major undertaking that required many independent reviewers. Our role at Touche Ross was to classify the products according to level, set up the test methodology used by the reviewers, and construct the table of results. We did inspect the software and its documentation, but we did not evaluate any of the

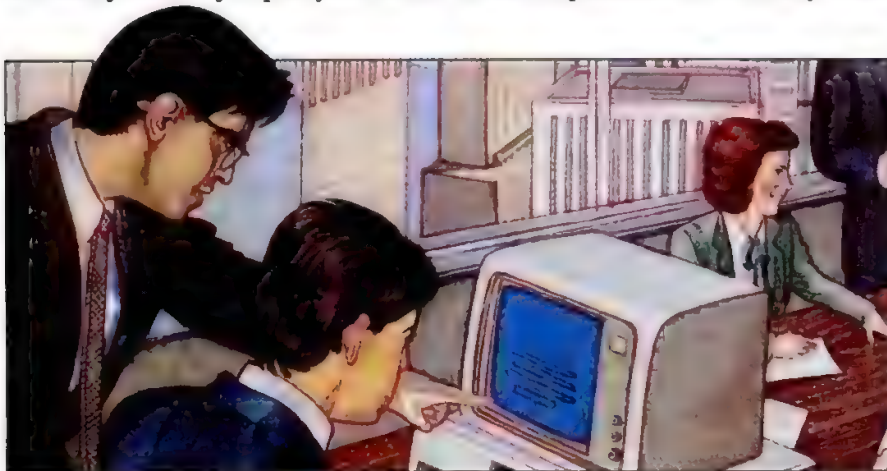


Illustration: Jeffrey Smith



QUESTIONNAIRE

products ourselves, nor did we edit the opinions expressed by the reviewers.

Before setting up the evaluation criteria we set some ground rules and screened the packages. All of the products are commercially available in the form that they were submitted to us. (We did accept versions with draft documentation, as long as the product itself was in final form.) Second, all of the products run on the IBM PC or PC-XT under DOS 2.1. While many users run their machines under other operating systems, most people have DOS available for their IBMs and compatible computers. We used Version 2.1 because this is the only version that IBM currently distributes.

We then categorized the products into three levels: project planning software, project planning and control software, and full-featured project management software. To understand the distinctions and why they may be important to you requires some explanation.

WORKING YOUR PLAN

Project management is a discipline that allows management of a nonrepetitive, goal-oriented environment. Its three major elements are planning, scheduling, and controlling. After a job (project) is requested, the project manager's first duty is to plan, that is, to identify the work necessary to complete the request and the types and quantity of resources that will be required.

To make a realistic plan, real-world constraints on staffing, budget, and resources must be imposed. This is the first area in which many software products are lacking. The simpler products do not allow any constraints to be placed on the project plan—they assume unlimited resources and time. With these products, the

DO YOU NEED PROJECT MANAGEMENT SOFTWARE?

If five or more of these conditions apply to the projects you manage, you probably do.

LONG PROJECTS:

- ☐ Number of tasks greater than 25
- ☐ Number of work days greater than 75
- ☐ Number of elapsed days greater than 60
- ☐ Budget greater than \$25,000
- ☐ 3 or more workers
- ☐ 2 or more resource types (people, machinery, and the like)

COMPLEX PROJECTS:

- ☐ Complex task-dependency structure
- ☐ Work depends on delivery of equipment or other resources
- ☐ Many milestones that need to be reported on
- ☐ Two or more project locations
- ☐ Two or more organizations participating
- ☐ Multiple related projects with interdependencies on tasks/resources
- ☐ Need to optimize projects—for example, resource leveling

SPECIAL ANALYSIS NEEDED:

- ☐ Reports sequenced in various ways—for example, by date, by resource, by responsibility
- ☐ Graphics—for example, Gantt, PERT, histograms, manpower loading charts
- ☐ Special reports—cash flow projections, network analyses, project master plans, assignment work plans, and so on
- ☐ Need to understand critical path and who has assignments on critical path
- ☐ "What if" calculations to determine exposures and balance resources between two or more projects and to determine the effect of adding or deleting personnel on the project

FREQUENT UPDATES/STATUS NEEDED:

- ☐ Weekly updates
- ☐ Status reports/redrawn PERT or Gantt charts
- ☐ Spontaneous questions on status of any task, milestone, resource
- ☐ Desire more control over scheduling and cost control



A PROJECT MANAGEMENT GLOSSARY

So you've put activities from the assignment work plan into a Gantt chart, only to discover that there's too much float. But what does it all mean?

Activity: One of the subunits of work that comprise a task. For example, staking out and digging are two activities in the larger task of laying a house's foundation.

Assignment work plan: Represents the work assignment of an individual and provides an understanding of the person's responsibilities and role in fulfilling an activity or task.

Critical path: That series of tasks or activities that, if delayed, will be the first to cause the delay of the project; the path that leads to the project end task with a minimum of accumulated slack time.

Critical path method (CPM): A project scheduling method based on the assessment of time required to complete activities on the critical path.

Dependent task: A task that cannot begin until one or more previous tasks are complete; for example, the walls of a house must be erected before the roof is put on.

Dummy activity: An activity used to account for nonwork/nonbillable portions of a project; for example, waiting time for materials to be delivered.

Early finish date: The earliest possible date a task or activity can be completed without interfering with the completion of any preceding activities.

Early start date: The earliest possible date a task or activity can begin; it often gives rise to slack time at the end of the previous activity.

Event: Also called "node" or "milestone," an event has no time frame associated with it, but typically serves to mark the start or end of activities and to relate activities to each other.

Float: The amount of time following the completion of a task or activity but prior to the start of the next dependent task or activity (or project end if there are no dependent tasks/activities).

Gantt chart: Named after its developer, Henry Gantt, a time-based bar, line, or arrow chart depicting start and end points of activities or tasks; the interrelationships/dependencies of activities are *not* shown.

Manpower loading chart: A histogram showing the allocation of labor by time period.

Milestone: See *Event*.

Network: The structure of relationships among a project's activities, tasks, and events.

Network analysis: A listing of the components of a project network, with their start/end dates, float, and dependencies.

PERT (Project Evaluation and Review Technique): A planning and control tool that identifies the interdependencies of project elements and attempts to determine the time needed to complete each in terms of pessimistic, optimistic, and best-guess estimates.

PERT chart: A diagram representing the interdependencies of work elements

against time, typically shown graphically as circles and connecting lines.

Progress reporting: Input of actual time, resource utilization, and task/activity completions; similar to time and expense reporting.

Project: An undertaking, having a definite objective and specific start and completion points, that is the composite of tasks and activities set up in a logical order to achieve the objective; for example, building a house.

Project control: The third phase of the project management cycle; it compares actual performance with the planned schedule and implements corrective measures to avoid project completion delays.

Project library: A database of projects, tasks, and activities that can be modified and applied when planning new projects.

Project plan: The first phase of the project management cycle, involving development and organization of the work plan.

Project schedule: The second phase of the project management cycle, detailing start and completion times for each task and activity.

Resource: Includes manpower, materials, equipment, and any other costed item utilized in completing a project.

Resource allocation: The assignment of resources needed to complete each task or activity.



Resource leveling: The scheduling of activities with float time to optimize the use of resources, thereby avoiding large fluctuations in resource requirements; see *S-curve*.

S-curve: A curve plotting manpower versus time, which is used to smooth out resource allocation—the goal is to develop a gradual build-up and subsequent cutback of manpower by rearranging resources utilized for activities with slack time.

Scheduling unit: The particular time period(s) in which a project is planned—hours, days, weeks, quarters, years, and so on.

Slack time: See *Float*.

Status report: An analysis of actual project costs and time expended against the plan, with variances calculated and displayed.

Subcontract: See *Assignment work plan*.

Task: A discrete element of a project, consisting of activities; for example, laying the foundation and landscaping are two separate tasks in the project of building a house.

Work breakdown structure (WBS): A comprehensive, hierarchical listing of the work elements and dependencies required to complete a given project; a useful tool for the project planner, serving as a predefinition to speed up the planning process.

Work package: See *Assignment work plan*.

planner is often forced to redo the plan many times until it fits the reality of the situation.

More sophisticated products not only allow resource and time constraints, but they also aim to build up staffing gradually at the beginning of the project and reduce staffing gradually at the end. This smoothing process tries to achieve what is called an *S-curve* and makes the project much easier to staff and manage. Such products often allow staffing and task dependencies across several projects as well as constraints on a single resource pool serving an organization.

Additional help is given when the product scans the task network for large accumulations of slack time in the hope that a reorganization of the network can alleviate having to bring staff off and then back on to the project. Once staff are removed from a project, it is often risky to assume that you can get them back as soon as you need them. Second, the reorientation necessary is seldom planned and invariably causes schedule and budget slippages.

The project manager's answer to the requestor generally consists of two parts—budget and schedule—justified by a listing of the tasks and resources required. This answer, sometimes called a *project master plan*, forms the basis for a work contract or project authorization. Every project management package lists the tasks and resources that are required to complete the project, but the most helpful ones present this information in a format that can be given directly to the requestor. The ability to draw project diagrams such as Gantt charts, PERT diagrams, manpower loading charts, and funding charts also helps the project manager and the requestor to understand the magnitude and complexity of the work effort.

The planning process doesn't stop there, however. Once authorization is given to go ahead with the project (this may take several iterations of the first pass of planning), the planner begins the difficult task of preparing work assignments for the project team members assigned to the first phase. This is best accomplished when the team members themselves work with the original planner using a similar planning methodology. The reason for involving team members in the planning process is twofold. First, you can gain their commitment on work estimates by involving them in the estimating process. Second, and just as important, it is an excellent way to make sure they understand the job they are about to tackle.

Next, the combined effect of the individual work plans must be contrasted with the original project master plan. Updating the project master plan must continue until the planner, the requestor, and the assigned workers agree on a work definition, schedule, and budget. Project management software varies in its ability to help accomplish this step. Most products can't freeze the original agreement between the planner and requestor and won't take it into account in subsequent reports. This is especially true of microcomputer software.

The products that we have included in Level I (project planning software) offer some or all of the planning facilities just described. All of them are useful in taking a first look at the requirements for a project and in sizing up the work effort needed to come up with a project master plan. The more-sophisticated products in this group allow individual work assignments to be planned as well. The 12 reviews that appear in this issue and the 12 that will appear in the next issue cover the 24 prod-



THE LEMON PROJECT

In this series of reviews, the authors' mission was to manage the development and introduction of the Lemon I personal computer.

The project management software reviews in this series are based on a hypothetical project that the authors "managed" with the software they reviewed. It began:

"As president of the newly formed Lemon Computer Company, you have decided to plan the introduction of your first product, the Lemon I, with a project management software package. The product will be a truly innovative portable personal computer, 100 percent compatible with the IBM Personal Computer. It will feature two full-page (66-line) flat-panel displays; a monochrome display for text and a color display for either graphics, a second page of text, or a horizontal continuation of the left screen for a total of 160 columns. All of these components will be integrated in a luxurious leather attaché case, with the displays mounted in the lid. With the lift-out, full-featured keyboard, 1 megabyte bubble memory, and a side-mounted, high-den-

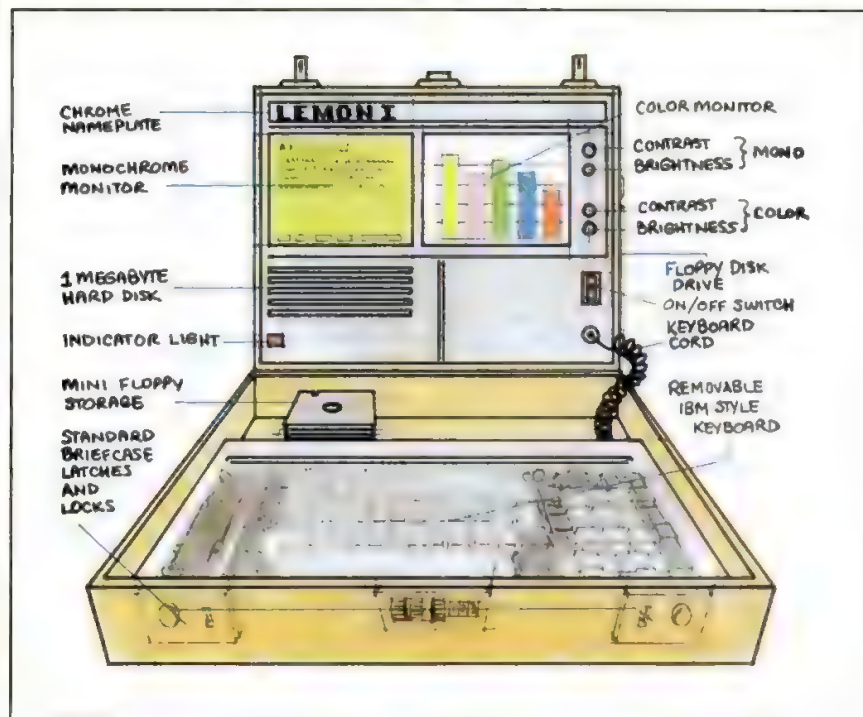
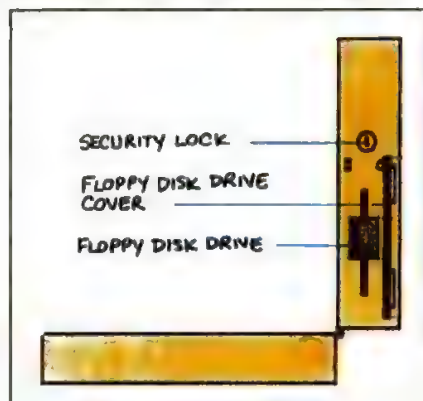
sity minifloppy, your product should be a hit.

The team members involved in your project will include the following ten individuals, code named A, B, D, E, F, G, L, M, N and Q."

Each author received a list of 84 tasks that covered all phases of the project and a PERT chart showing task dependencies. The list of tasks included such

assignments as building a model for the Lemon I, estimating costs, selecting advertising copy, ordering raw materials for manufacturing, shipping the product to distributors, and introducing the product. For each task, the list also included the start date, the number of work days needed to complete the task, and which team member was responsible for accomplishing it. —K.H.

We challenged project management software by applying it to a case study: the production of a hypothetical, if ridiculous, Lemon I computer. The machine never materialized, but how did each program bear up?





PROJECT MANAGEMENT

ucts that fall into Level I.

The next step in project management is to control the work effort and to report the progress made to management, to the requestor, and to the project team. Work estimates for assignments have been agreed upon, and a way of recording time must be adopted to make progress reports on the assignment work plans. Most importantly, forecasts of the time remaining for each active task must be relayed by the team member so that accurate status information can be generated.

All of the Level II (project planning and control) software packages can do some kind of progress reporting against the work plan and can generate status reports showing plan versus actual results. We were able to obtain nine packages in this class; reviews of them will appear in the third article in this series.

An invaluable tool to a project manager is the ability to monitor the status of a project with a series of project control reports that compare actual performance with the planned schedule. Very often this task is performed manually and consequently is error-prone and consumes a great deal of time. This is especially true if you need to redraw complex charts or prepare a series of reports. The reports should include an updated network analysis for the project manager, status reports for the team members and manager, and project summary reports for the department manager and the requestor.

When many projects compete for the same resources, a higher level of support is needed for successful management.

Level III (project management) software allows for the coordination of several projects that share resources. This type of software is generally beyond the needs of the single user, but it may in fact be

required in complex multiproject situations. We found two products that address the requirements of a project environment. One product works in conjunction with a mainframe-based package while the other uses the subproject concept.

Level III software not only addresses the needs of a multiproject environment but typically also provides an increased level of support for individual projects. One example of this is the archiving of a series of work breakdown structures (WBS). A work breakdown structure is a multilevel or hierarchical listing of tasks to accomplish a specific goal—new product development, for example. In its most complete implementation it also includes dependencies between work elements as well as guidelines for estimating them. When a WBS library is tied to interactive project planning software, the planner is prompted through the plan and is therefore freed from typing descriptions of all the common tasks. The WBS becomes the plan's foundation and the driving force behind the planning mode. An analogy to this capability is the spreadsheet template, many of which are marketed for common worksheet use—for predefined financial statements, for example.

Another example of support for individual projects is the project library. Using the analogy of the electronic worksheet, this would be like having a library of completed spreadsheets as opposed to generic worksheet templates. This is useful to the planner who is tackling several similar projects or emulating a project previously planned.

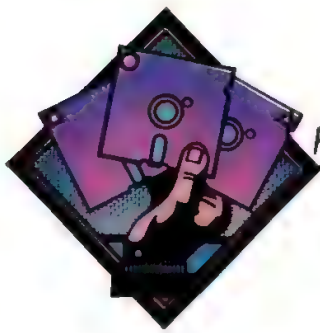
Another area where more sophisticated software can achieve payback is in progress reporting to the project control module. The typical time and expense form could be an output for our signature

AN INVALUABLE TOOL
TO A PROJECT
MANAGER IS THE ABILITY
TO MONITOR A
PROJECT WITH A SERIES
OF PROJECT CONTROL
REPORTS THAT COMPARE
ACTUAL PERFORMANCE
WITH THE PLANNED
SCHEDULE.

rather than a redundant input that needs to be reconciled with our project progress reporting. Sophisticated project management software can also capture individual forecasts by project team members and calculate updated networks with these forecasts. This is the real-time project control that a manager needs in order to manage a project in progress rather than playing Monday morning quarterback after the results are in.

Software evaluations are very difficult to do. When considering which product is most likely to satisfy your needs at a cost you are willing to pay, take a look at the chart accompanying this article. Bear in mind the fact that this article will appear in three parts and that you should consider all of the Level I, II, and III packages before you make a decision on which product you are willing to try. ■

Ken Edwards, CMC, is a manager with the Executive Office of Touche Ross & Co. He has 15 years of consulting experience and is currently in charge of the firm's microcomputer support center.



CPM/PERT: A GOOD INTRODUCTION



CPM/PERT, Version 2.0

Elite Software Development, Inc.

P.O. Box 1194

Bryan, TX 77806

(409) 775-1782

List Price: \$249

Requires: 128K RAM, one disk drive.

CIRCLE 752 ON READER SERVICE CARD

The *Critical Path Method and Job Scheduling Program*, or *CPM/PERT*, from Elite Software Development, Inc., of Bryan, Texas, is a simple and easy-to-use project management tool. Although it lacks some of the advanced project planning techniques and reports available on more costly products, it's well suited to introducing beginners to the intricacies of project management.

To install *CPM/PERT*, the user must include IBM's ANSI.SYS driver in the CONFIG.SYS file, which requires DOS 2.x. The program provides an appropriate CONFIG.SYS and ANSI driver, but the documentation does not discuss including the ANSI driver in an existing CONFIG.SYS. This common problem could confuse naive users with hard disk drivers or other necessary hardware drivers installed on their systems. Once the CONFIG.SYS is set, however, you merely copy the distribution disk onto your hard or floppy disk. The program is not copy protected and installation time is essentially nil.

DOCUMENTATION

The documentation covers all versions of *CPM/PERT* and includes instructions for CP/M and TRS-80 computers, as well as for the PC. The program comes without a disk tutorial, but the manual offers sam-

ples of typical interactions, and the disk provides a short sample data file. This proved straightforward, and I ran through it in less than half an hour.

I examined preliminary documentation, which was missing some example reports and screens. The manual I saw consisted of word processor output photocopied onto full-size pages. It appears that the manual's final form will be something similar. Like the program, the manual seemed well-written, clear, and easy to understand. Its explanation of the concepts behind CPM and PERT will give even newcomers to project planning enough insight into the process to quickly start creating usable planning output. Even though the manual skips around a bit, a good table of contents and index make it easy to find the information you're looking for.

OPERATION

Program operation is straightforward. When first invoked, *CPM/PERT* determines available memory and advises the user how many variables can be handled. On a PC with at least 128K RAM, *CPM/PERT* can manage 600 variables, enough for even sizable projects. Unfortunately, the program checks with the user to make sure the clear-screen code is correctly installed. While this is necessary on a CP/M system, which may use a wide variety of terminals, it's redundant on a PC. The program also prompts for the date as a character string (for example, October 30, 1984), but it's easier to just pull the system date from the computer.

A simple master menu controls program operation. Option 1 allows setting the title of the project, the project coordinator's name, and other general data relevant to the overall project. The next step involves defining a holiday schedule (Op-



the other offending activities, the program moved on.

REPORT OPTIONS

Menu Option 4 displays or prints a report summarizing the input data. The report is the same whether CPM or PERT has been chosen; the CPM output merely shows the same time duration for Optimum, Likely, and Pessimistic forecasts. Option 5 generates the various available reports, including a Critical Path Report, Holiday and Calendar Reports, and an Activity Cost Report. These reports are legible, detailed, and easy to understand.

CPM/PERT produces Gantt charts on any standard printer, but graphics and plotting are not supported. A submenu allows the user to specify the character symbols for the critical path, slack time, date breaks, and so on. Much like spreadsheet programs, *CPM/PERT* segments large charts onto multiple pages that you can paste together to create one, long, unified exhibit. The program's Gantt charts are well done, although I find plotter output superior for elegance and readability. The sorting and calculations required by PC's model took *CPM/PERT* 2 minutes and 9 seconds to perform. The system must do these calculations each time it produces a chart, since it cannot store the results of its calculations.

SUMMING UP

CPM/PERT operates smoothly and easily within its limitations. Obviously a converted CP/M program, it lacks "polish" in the PC environment and fails to use any of the PC's hardware capabilities. It simply does not speak the PC's language like a native. Nonetheless, what it does do, it does well. —Glenn Hart

DATA*EASY PROJECT MANAGEMENT: NO FRILLS

*Data*Easy Project Management, Version 1.2*

Data Consulting Group
12 Skylark Dr., #18
Larkspur, CA 94939
(415) 927-0990

List Price: \$50

Requires: 64K RAM, 80-column
printer.

CIRCLE 749 ON READER SERVICE CARD

The *Data*Easy Project Management* program is a chopstick trying to masquerade as a baseball bat. It claims to be a full-function project manager, but it just doesn't make it in the big leagues.

*Data*Easy* is a bare-bones, no-frills program that can handle a project of up to seven tasks and up to 99 weeks long. Only 10 weeks of the project can be graphed on-screen in a Gantt chart, however, and if you want a chart showing more than seven tasks, you must assemble it by screen-dumping several graphs onto a dot matrix printer and then pasting the hard copies together.

Unfortunately, *Data*Easy* has other graphics-related limitations. For example, it can't calculate or show pictorially what tasks relate to or depend on other tasks. Nor can it so indicate holidays or financial limitations. The limitations make it questionable whether *Data*Easy* is a useful program for anyone except managers of the simplest projects—in which case, they might find a felt-tip pen and a stack of graph paper adequate.

Installation is straightforward, although it may appear complicated since the 16-page introduction/installation sec-

tion of the manual is a generic document for all 24 programs in the Data*Easy family. The process, in fact, should take about 5 minutes, but PC-XT users may need 10 to 15 minutes because of the confusing instructions. I suggest that anywhere the instructions and your common sense head in opposite directions, you should probably trust your instincts. For instance, the instructions say XT users should copy the original disk from the A: drive to the B: drive. Your instincts would tell you that it should be to the C: drive. The AUTOEXEC.BAT file should be modified to include ASSIGN A=C to redirect the program's tendency to look for everything on the A: drive.

To install Data*Easy, you have to format a blank disk, add DOS, BASICA (or GWBASIC), and MODE.COM, then copy everything from the original diskette onto the working diskette. PC users running GWBASIC must also substitute a special AUTOEXEC.BAT file. A cryptic message advises DOS 2.0/2.1 users to set the CONFIG.SYS file to FILES=13 to allow that many files to be open at once.

Moreover, there is no tutorial or sample data. For such a simple program, a tutorial might be overkill, but a sample project included on disk and referred to in the manual would ease the get-acquainted period.

Data*Easy comes in a peach-colored IBM-size binder, which is common to the Data*Easy family. Inside there are the 16

introductory pages, 1 page of information about the current version, and then 10 pages of operating instructions run off on a dot matrix printer. There is no index. Only the introduction has a table of contents. Even by the decidedly mediocre standards of microcomputer documentation, this manual suffers from lapses in grammar and punctuation.

CASE STUDY

Learning to use Data*Easy is a process of trial and error. It took me 3 hours to analyze and duplicate the case study of the mythical Lemon I project. And all I had to show for my work were two printouts listing the 84 tasks and their status (sorted in no useful order) and a bunch of Gantt chart segments. That's the extent of Data*Easy's capabilities.

The program offers 12 options on its main menu. Options 1 through 5 are mostly housekeeping. Option 1 sets the time and date. Options 2 and 3 initialize the BASIC files that will hold the framework

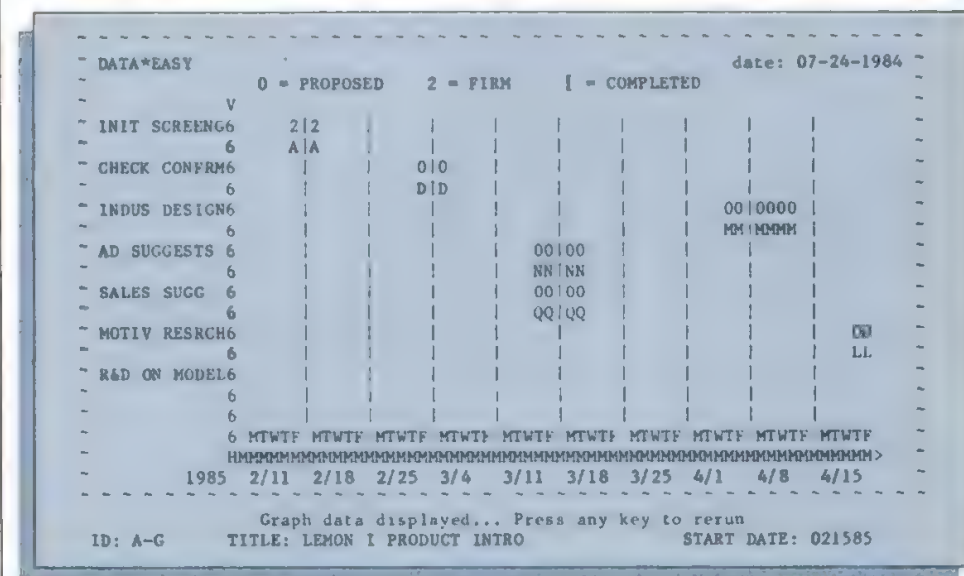
of your information (the definitions file) and the actual data (the data file). Option 4 deletes a set of data. Option 5 edits the "control file," which contains the system

GRAPHICS-RELATED
LIMITATIONS MAKE IT
QUESTIONABLE
WHETHER DATA*EASY IS
A USEFUL PROGRAM
FOR ANYONE EXCEPT
MANAGERS OF THE
SIMPLEST PROJECT.

date and the user's name.

Options 6 and 7 are for data entry. Ideally, the two steps should be one. Option 6 establishes the outlines of projects, giving each a cryptic five-character ID, which you must remember when you get to Option 7; a 32-character project title, which appears on the reports; and a project start date, which is a six-digit number

● The Data*Easy Gantt chart allows the user to input proposed as well as previously planned tasks. It illustrates comparisons and shows the person responsible for a particular task in the project.



FOR SUCH A SIMPLE
PROGRAM, A TUTORIAL
MIGHT BE OVERKILL, BUT
A SAMPLE PROJECT IN
THE MANUAL WOULD
EASE THE GET-
ACQUAINTED PERIOD.

without slashes separating days, months, and years. The date is window dressing; no calculations are performed with it. Each project can have seven tasks, identified by 12-character labels.

If your project has dozens of tasks like the Lemon I project, it has to be broken into seven-task segments. Once the projects and tasks have been named, the user goes to Option 7 to enter information about the project. Each project is recalled from disk by its five-character title; each of the seven tasks associated with each project is identified as 1, 2, 3, 4, 5, 6, or 7. The user can give each task start and end points (in weeks and days) over a 99-week span, define it as preliminary, firm, or complete, and add a one-character code, which could be used to identify the person responsible for the project or to indicate the project's priority. You can't enter specific dates, only weeks and days from the first full week of the year. For example, Monday, January 14, 1985, is entered as week 2, day 1 of year 85.

Because it may be hard to remember the cryptic project IDs and which tasks go with which projects, Options 8 through 10 allow printouts of the control file, the project definitions, and the data file. The lists are supposedly rerouted to the screen if no printer is connected, but that didn't happen during my test. After 30 seconds

of "nothingness," the program resumed.

Options 10 and 11 graph the projects on-screen, using the PC's monochrome graphics set, and show 10 Monday through Friday weeks or 7 Monday through Sunday weeks. The user selects a project to graph by entering the project ID, the starting and ending weeks, and the year.

The screen displays a Gantt chart—the only type of chart the program has—for one project and its seven tasks. To the left of each row is the 12-character task name. At the bottom of the screen is the mm/dd date of each Monday in the chart, the project name, and the project start date. Proposed, firm, and completed tasks are represented by light, medium, or solid bars. Under each bar is the single-character code the user enters to represent the person responsible or the task's priority. Graphs take only a few seconds to display, since there's no sorting or rearranging done. The chart is printed by pressing the Shift-PrtSc keys.

*Data*Easy* had trouble charting projects that spilled over from late one year to early the next, even though it claims a 99-week project cycle for any year from 1980 to 1999. Occasionally it stopped running altogether, but without locking up the system. By typing RUN, I was often able to get things back on track.

Deleting a task doesn't shift other tasks; it just leaves a blank in the chart. And, what's worse, adding a last-minute task requires deleting another one or starting a new project file.

SPECIAL FEATURES

*Data*Easy* has only two special features worthy of note: it runs on a hard disk

with no hitches (after you reassign drive A: to drive C:), and it does a nice job of generating graphics on the PC's monochrome screen using the extended PC character set. There's no need to buy a color monitor and graphics board. Even with a color monitor, everything comes out black and white.

The program stands alone; it can't take data from another program or output it to a third program.

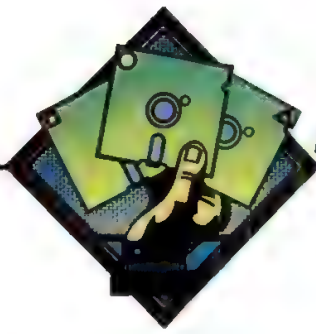
Data Consulting Group specializes in low-cost programs written in BASIC and assembly language. The company says *Data*Easy* is aimed at the first-time project management software user who has fairly simple needs and isn't interested in charting the financial aspects of the project. It has no intention of competing with sophisticated project managers, a spokesman says.

The software does work, but it is cumbersome and limited. Furthermore, the documentation is skimpy, though, admittedly, there's not much to document. For \$50, *Data*Easy* does a passable job of generating little Gantt charts.

Will *Data*Easy* make you a better manager, help you understand the project better, or get the project done faster or more efficiently? Not likely—especially if you're playing in the big leagues.

—William K. Howard

THE SOFTWARE WORKS,
BUT IT IS CUMBERSOME
AND LIMITED. THE
DOCUMENTATION IS
SKIMPY, BUT THEN
THERE'S NOT MUCH TO
DOCUMENT.



DEMI-PLAN: ECONOMY EXACTS A PRICE



Demi-Plan, Version 3.1

Demi-Software
62 Nursery Rd.
Ridgefield, CT 06877
(203) 431-0864

List Price: \$49.95

Requires: 128K RAM, one disk drive.

CIRCLE 792 ON READER SERVICE CARD

D*emi-Plan* could be regarded as a budget-priced door opener to electronics project management. The system determines critical paths, computes slack times, and prints Gantt charts—all for the incredible price of only \$49.95.

On the other hand, if you're spending over \$3,000 on PC hardware to schedule long, complex projects, do you really think a \$50 management tool will cut the mustard? In the case of *Demi-Plan*, the unequivocal answer is no.

DIME-STORE QUALITY

Demi-Plan delivers economy, but it's the type most users will prefer to forgo. Using it is like substituting a dime-store telescope for a navigational sextant. Although you might eventually reach your destination, the grief and aggravation expended offset the initial savings.

Demi-Plan's problems begin with installation. The user's manual instructs you to copy one file from the distribution disk to a blank, formatted disk. Then you invoke the program by typing DEMI-PLAN. As simple as this procedure is, it's wrong because there are two files that must be copied. While experienced PC users may resolve the oversight quickly, novices will be stymied.

For documentation, the vendor sup-

plies nine scant pages describing the program's seven menu functions. The function descriptions range from several paragraphs to two sentences, excluding the terminate function, which is left out completely.

From one perspective, the documentation could be construed as adequate because of the banal simplicity of the program; there are no function keys to learn or fancy editing of keyboard entries. If you make a mistake while entering one of the six fields composing a task description, the program imposes a simple solution—re-enter all six fields.

A SNAIL'S PACE

Demi-Plan's annoying get-it-all-right-or-do-it-over mode of data entry slows input time to a snail's pace. I spent 2 hours

USING DEMI-PLAN IS
LIKE SUBSTITUTING A
DIME-STORE TELESCOPE
FOR A NAVIGATIONAL
SEXTANT. ALTHOUGH
YOU MIGHT EVENTUALLY
REACH YOUR
DESTINATION, THE
AGGRAVATION OFFSETS
THE INITIAL SAVINGS.

entering the 84 tasks for the case study, about twice as long as a system with a screen-oriented editor.

The method of handling dates also retards the input process. The program uses no dates per se. Start times are expressed as numbers of days relative to the project's commencement. If the project begins on February 15, 1985, then

PROJECT-START-DATE	APR 19	MAY 3	MAY 17	MAY 31	JUN 14	JUN 28
07/30/84	85	85	85	85	85	85

SCALE=DAYS	190	200	210	220	230	240
------------	-----	-----	-----	-----	-----	-----

**** TASK ****

```

initial screening
check prodct conform
industrial design
motivation res.
research & dev.
advertising sugg.
sales sugg.
build crude model
estimate manufac.
executive reactions
estimate market
estimate comp. beh.
estimate mark. pot.
price vs demand c.
review manufacturing
estimate distrib.
estimate advert.
preliminary financ.
preliminary price
full scale test
consumer reactions
check prodct non v.
complete prod. des.
equipment for man.
engineering lab test
manufacture models
buy raw materials
sampling techniques
preliminary adver.
preliminary sales
determine financial
financial forecast
set-up samples
get interviewers
market test forms]
preliminary media
market tests
investigate distr.
train-interviewers
code & tabulate test
evaluate test res.
improve product
investigate names
establish quality
investigate patent
plan manufacturing
management go-ahead
patent application
determine seasonal
set advertising bud.
evaluate media
select name
select sales man.

```

DEMI-PLAN'S GET-IT-ALL-RIGHT-OR-DO-IT-OVER MODE OF DATA ENTRY SLOWS INPUT TIME TO A SNAIL'S PACE.

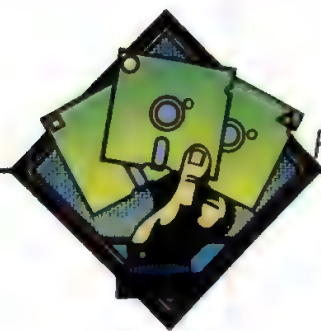
tasks beginning on February 20, 1985, and March 28, 1985, must be entered as start-days 5 and 41.

To enter tasks, you select the menu option Add, Change, or Delete Task followed by the Add suboption. The program then prompts for task data, such as a four-digit task number; 20-character task description; task duration in days; resource or responsibility code; predecessor task number (if any); and start day. Following each entry, you're catapulted back to the main menu where you must again select the Add option and suboption and start the process again. The system lacks an add continuous mode.

USER BEWARE

The program's response to a misstroke in the entry of the task number further demonstrates the system's inflexibility. The user-assigned task number is the key to accessing a task. If you mistakenly try to add a task number that has been previously added, the program notifies you accordingly and prompts for another number. There's no way to back out or abort. Once task addition mode has been selected, you're forced to add a task. Task modification and deletion follow the same unyielding pattern—changing your mind is a no-no.

● Critical tasks along the project path ("C") are identified by this Gantt chart.



During task number entry, you should beware of accidentally pressing a non-numeric key. Such a slip of the finger causes the program to issue the very informative "?Redo from start" message that discloses *Demi-Plan's* programming language origins, but this information is of little value to users who are unfamiliar with BASIC.

Once you've entered the project tasks, the system offers two report formats: Gantt charts and task/resource listings. The Gantt charts can be printed on a scale of days or weeks with 4-, 5-, 6-, or 7-day workweeks. The reports can only be routed to the printer, which should be on-line before you start to print or *Demi-Plan* will turn your PC into a municipal air-raid siren. The siren can be disabled only by a Ctrl-Alt-Del reset from the keyboard or by the activation of the printer.

COUP DE GRACE

Perhaps the coup de grace of *Demi-Plan's* operational deficiencies is the menu command for saving data. First of all, *Demi-Plan* has no save command—it's a save and end command. Every time you want to save your project file on disk, you must end the program and reload it to continue. However, ending doesn't mean returning to DOS, which would be forgivable. The program inexplicably quits or dies. Your PC can be revived only through a keyboard reset.

NO FREE LUNCH

Overall, *Demi-Plan* might barely rate a passing grade in Programming 101, but as a professional tool for project management, it fails. Conventional wisdom says there is no free lunch. Don't count on *Demi-Plan* to set a precedent.

—Edward Joyce

EMPACT: LOW COST AND NO NONSENSE

EMPACT, Version 1.0

Applied MicroSystems, Inc.

P.O. Box 832

Roswell, GA 30077

(404) 475-0832

List Price: \$149.95

Requires: 256K RAM, one disk drive.

CIRCLE 791 ON READER SERVICE CARD

EMPACT is to Gantt charts what a screen editor is to text. A Gantt chart displays the start time and the completion time for individual tasks in a complex project. *EMPACT* allows you to enter and modify these task descriptions and schedules, and though it's far from perfect, for \$149.95 it opens the door to computer-aided project management.

A simple, 5-minute installation procedure sets the stage for project scheduling with *EMPACT* (Electronic Manager of Projects, ACTION items, and Tasks). You copy the three files on the single distribution disk to a hard disk or to one or two floppy disks depending on your hardware configuration. The program can execute from a single disk, which is an advantage over programs requiring multiple disks that treat the disk drives like revolving doors.

Following the user manual verbatim and proceeding directly to the system tutorial leads, unfortunately, to a dead end because the program can't find its help file. A little trial-and-error exercise solves the dilemma. After all, it's hard to completely misplace a file in a system consisting of only three files. Even so, this problem does convey the flavor of the abridged documentation. Though the 30-page manual adequately explains the software (the 16 screen illustrations make a major con-

[illegible]

tribution in this regard), it could stand some polishing.

DATA ENTRY

Of course, given the simplicity of the system, an inch-thick reference manual would be overkill. And the program's on-line, context-specific help screens put many operational questions to rest. After spending just 30 minutes with the user manual tutorial and a demonstration file supplied on the distribution disk, I felt confident enough to strike out on my own. I created a fresh file and entered the 84 tasks listed in the standard case-study project. That took an hour, and a more intelligent data-entry system could have considerably shortened the process.

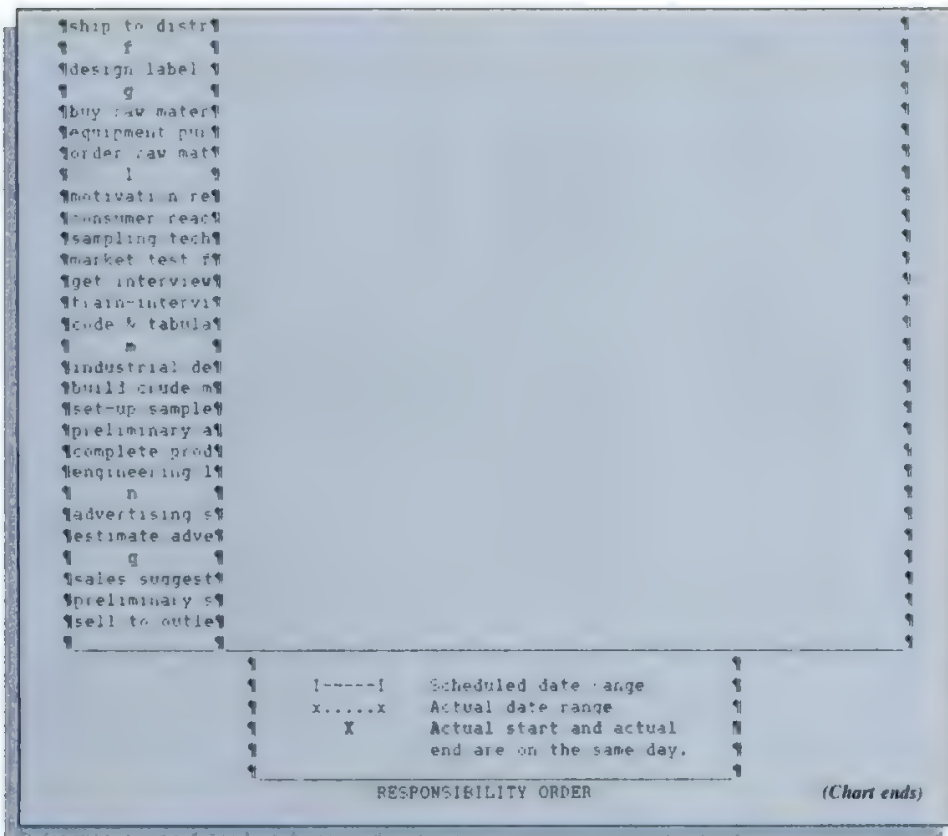
For example, the raw case-study tasks include start dates and work days. Even though *EMPACT's* input template prompts you for start dates and end dates, it won't calculate end dates, requiring you to mentally add the work days to the start date to arrive at the end date.

After performing these calculations 84 times while making allowances for 28-, 30-, and 31-day months—not to mention leap years—I felt as if the Gregorian calendar had become etched on my brain. Your gray matter must also take responsibility for verifying the dates as you enter them. According to the user's manual, the program regards dates conflicting with the MM/DD/YY format as "invalid," but I found it accepted any string of characters.

My other major data entry and modification complaint involves the procedure for updating the file on disk. *EMPACT*

- The Gantt chart in this example has the added capability of portraying scheduled tasks versus actual tasks in relation to time.

AFTER MAKING
ALLOWANCES FOR 28-,
30-, AND 31-DAY
MONTHS—NOT TO
MENTION LEAP YEARS—I
FELT AS IF THE
GREGORIAN CALENDAR
HAD BECOME ETCHED
ON MY BRAIN.



buffers project/task descriptions in RAM. The program applies all additions and modifications to this RAM image of the file. The file is updated onto the disk only when you exit the program or select another project for editing. The program needs a *WordStar*-type save-and-resume command or a *Multiplan*-style transfer/save command. Exiting the program or project file to preserve your data is like developing the film in a camera after every shot to save the photo.

Worst of all, the procedure results in updating a project plan file regardless of whether you made any changes. Essentially, the system lacks a browse mode. Once you invoke the program, the project plan

is written back to disk unless you kill the program with a keyboard reset.

OPERATION

After data entry, the program produced reports without a hitch. The report menu offers seven selections, mostly variations on a boiler plate format that shows, for each activity, the description, responsibility code, schedule start and end dates, and actual start and end dates. The project plan can also be reported on Gantt charts complete with graphics symbols. The charts can be arranged according to the person responsible for them in chronological sequence.

Of these reports, only one can analyze

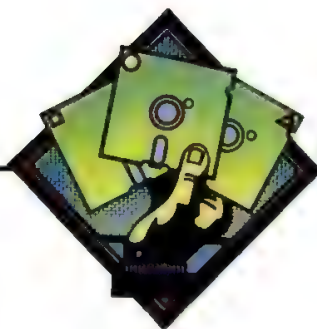
a project plan. Called, appropriately, Analysis, it shows the number and percentage of tasks completed, as well as the earliest and latest scheduled start and end dates of the entire project.

EMPACT generates reports within a few seconds, reflecting the speed of RAM buffering. You have the option of directing the report output to disk, printer, or screen. Gantt charts show up with graphics symbols both on the screen and on dot matrix or letter quality printouts.

A window that can open on any part of the report handles screen output. The arrow keys move the window horizontally and vertically. The *PrtSc* key prints out a screenful of data, including graphics symbols. According to the documentation, *EMPACT* employs an "intelligent screen-dump routine" to process the graphics symbols.

EMPACT also uses windows judiciously in its file-maintenance function. The screen can be split into three parts: data for project tasks, a calendar for a given month and year, and a menu. The project window holds up to 13 tasks; viewing others is a matter of pressing the PC's Home, End, PgUp, PgDn, or arrow keys.

The calendar is posted for reference to



assist you in scheduling. You can select any month/year combination, and *EMPACT* will instantly display that calendar. It automatically determines and highlights holidays—with the exception of Veterans Day, which the program doesn't seem to celebrate.

WISH LIST

EMPACT comes close to being a good buy. With three improvements, there'd be no question about its value. First, I'd like to see the dates handled with more finesse. I want the ability to edit them for valid characters to ensure that the start date precedes or equals the end date, and to calculate an end date given a starting date along with a specified number of days.

Second, there should be an overt command for saving a project plan on disk. The implicit save made while exiting masks the consequences of failing to save regularly. As it stands, novice computer users may be lulled into thinking that the 3 hours worth of task data they entered is safe because it's "in the computer." They'll learn otherwise after a few abrupt power interruptions.

Third, *EMPACT* needs an elegant way of browsing and exiting an update session without recording the file on disk. Since the program already seems to buffer everything in RAM, this enhancement should be a simple matter of adding an abort command to the menu.

Applied MicroSystems started distributing *EMPACT* in July, so I suspect that the company will incorporate these and other improvements before long. In the meantime, if you're searching for an easy-to-use tool, take a look at *EMPACT*. It may contain the reporting functions you need to streamline your project control and scheduling. —Edward Joyce

EX-PERT/80: A PROGRAM FOR SMALLER JOBS



EX-PERT/80, Version 4.2

Decision Support Software, Inc.

1300 Vincent Pl.

McLean, VA 22101

(703) 442-7900

List Price: \$115

Requires: 64K RAM, one disk drive, 80-column printer.

CIRCLE 750 ON READER SERVICE CARD

How sophisticated must a project management program be? The answer depends, of course, on just what you want to do with it. A tractor-trailer rig can haul lots of heavy material from place to place, but not everyone needs the capacity or the power of an 18-wheeler.

EX-PERT/80 does not have all the complex features that some programs have, but then again, at \$115, it costs one-half to one-third as much as most of its competitors. When comparing this program to others, you must keep in mind how much power you need and how much you want to pay to get it.

INSTALLATION

Originally created on a mainframe, *EX-PERT/80* was later rewritten to run on a Radio Shack TRS-80 Model I. Needless to say, this first microcomputer version ported only the bare essentials from the mainframe version. Since that humble start, other versions have been written for the TRS-80 Model III, the Apple II and IIe, and now the IBM PC.

Despite its crossbreed parentage, the IBM PC version is a plain vanilla, interpreted BASIC program. And since *EX-PERT/80* has few frills, it is fairly easy to work with. It does not require any installation procedure; just put the disk in the

129

A TRACTOR-TRAILER RIG CAN HAUL HUGE AMOUNTS OF HEAVY MATERIAL FROM PLACE TO PLACE, BUT NOT EVERYONE NEEDS THE CAPACITY OR THE POWER OF AN 18- WHEELER.

duration estimates and quantities of a single resource required for a task.

EX-PERT/80's data-entry procedure shows the package's age and its BASIC background. You enter the task name on one line. The program then prompts you for a string of comma-separated values: start node, end node, optimistic duration, likely duration, pessimistic duration, resources required. If you miss one of these six items, you are told to "Redo from start." If you enter wrong data, you must leave the add tasks mode, go to the fix tasks mode, and then make the corrections. Also, in the fix tasks mode you are told that you may press Enter to keep the old value, which is displayed in parentheses. Following this advice resets the values to zero.

The data entry system, while not particularly easy to use, was at least quick. It took me only about 30 minutes to enter the case study's 85 tasks. I encountered no appreciable lag when entering tasks, aside from brief pauses on one or two records. After saving the list of tasks on the disk, I selected the Solve Problem option. In 54.4 seconds, the solution was complete, although I received the warning that there was an "inconsistency in the network" of tasks.

When I went to print the list of tasks with their early and late starts, duration, and slack time, I found that some had impossibly large values. I also discovered that the only way to get a printout of this list was to use the PC's PrtSc key. In order to time the listing, I had to toggle the Ctrl-PrtSc key combination to direct screen output to the printer as it was displayed on the screen. In fact, only the Gantt chart is designed as a printed report, and it is not available on the screen.

When I tried to print the Gantt chart, the program crashed with an ominous message, "INTERNAL ERROR NUMBER 4 DETECTED IN LINE 166." After I carefully checked each item in the test data, a second attempt produced exactly the same results.

I called Decision Support Software (which has no toll free number) and was immediately connected with someone who seemed to understand what I was talking about. He told me that he would check with the programmer and would get back to me with some information. It was late in the day, and he called back early the next morning to say that the problem was probably nodes that were unconnected in one direction or the other. Furthermore, he said that if I were unable or unwilling to find the problem in the data, I could send a copy of the disk to him and he would check it over for me.

A thorough examination of the case study network chart revealed nine "dangling" nodes. I created dummy tasks to link these to the first or last node in the network (to eliminate the possibility that these dummy tasks might affect the critical path) and tried again. This time *EX-PERT/80* took just over 1 minute to solve for the 94 tasks (85 original and 9 dummy tasks). The task list took 2 minutes to print, and

the Gantt chart took 6½ minutes (and six sheets of paper).

It was a simple matter to remove the required task from the list and solve the problem (1 minute and 14 seconds), and then replace the task and solve again (1 minute and 14 seconds). The critical path and project completion times were the same at the start and finish of the operation, and both changed when the task was removed.

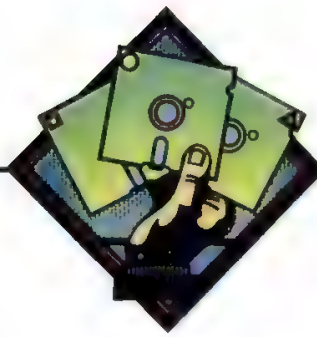
In all, it took me 3 hours to work through the entire case study. Keep in mind that nearly half of the time was consumed by the search for the dangling node problem, and that data entry went especially quickly, since so much of the case study information could not be entered.

SOME UNIQUE FEATURES

As you can see in the comparison chart, although *EX-PERT/80* lacks many features found in other programs, it does have some interesting features of its own. Since it accepts pessimistic and optimistic task duration estimates, it can produce probabilities for a range of project completion

EX-PERT/80 LOOKS LIKE
IT WAS WRITTEN IN
BASIC, WHICH, IN FACT,
IT WAS. IT DOES NOT
HAVE MANY FANCY
FEATURES, AND SOME
PARTS OF IT ARE
DOWNRIGHT DIFFICULT
TO WORK.

dates. It can print a graph showing the quantities of a single resource required on each day of the project. You can request an event calendar that shows the day, the



task, and whether the task must (or may) begin or end on that day. You can even obtain a list of all tasks that must (or may) be active within a range of days or on a single day.

The program's "dynamic dimensioning" feature takes full advantage of all available memory. While *EX-PERT/80* will run in as little as 64K RAM, any additional memory permits you to add more tasks to a project. With 192K on my machine, I had the capability of adding up to 999 tasks. While this feature was not explained in the manual, it is still nice to know that the program will use all the extra memory I bought.

Decision Support Software plans to add new features about once a year. Next on their official wish list is a resource "smoothing" function that will adjust slack time assignments so that the total resource draw on any given day does not exceed a limit that you specify. The company is also considering adding some simple calendar functions.

CONCLUSION

EX-PERT/80 is an older program with a long lineage. It looks like it was written in BASIC, which in fact, it was. It does not have many fancy features, and some parts of it are downright difficult to work. On the other hand, it doesn't cost nearly as much as some programs that have big names in the business, and it gets the job done for many users. In spite of its quirks, it is extremely easy to set up and to learn; you hardly need the manual at all. The manufacturer's support is friendly and responsive. *EX-PERT/80* seems to be an excellent value. If a big rig is too much for your task management application, this little pickup might be just what you need.

—Alfred Poor

GARLAND PATHFINDER: SIMPLE SCHEDULES



Garland Pathfinder

Garland Publishing, Inc.
136 Madison Ave.
New York, NY 10016
(212) 686-7492

List Price: \$299

Requires: 128K RAM, two disk drives,
132-column printer (or 80-column
printer with compressed print).

CIRCLE 746 ON READER SERVICE CARD

Pathfinder, from Garland Publishing, Inc., is a simple system for project planning and scheduling. Although it can't produce PERT charts or dependency reports, it does generate useful schedule reports and Gantt charts. The system is easy to use.

To install *Pathfinder*, you simply copy the files with the DOS COPY command. The source diskette is not copy-protected, and there are no installation programs to run. (*Pathfinder* cannot be tailored to your particular equipment.) Installing the system took me about 4 minutes.

In lieu of a tutorial, the system disk includes a sample project file, which is documented in the manual. Reading the manual and using this file gives you a good understanding of the system's information requirements and its capabilities.

The small, 61-page manual is typeset, fairly easy to read, and well organized. However, it does not have an index, and it fails to include some important information, such as a license agreement or contract and a telephone number.

The case study took me 6 hours to complete, including an hour spent diagnosing and fixing several problems involving the calendar file. I also chose to use the max-

imum number of sort options in my first group of reports, which probably were not required and which added an extra half hour.

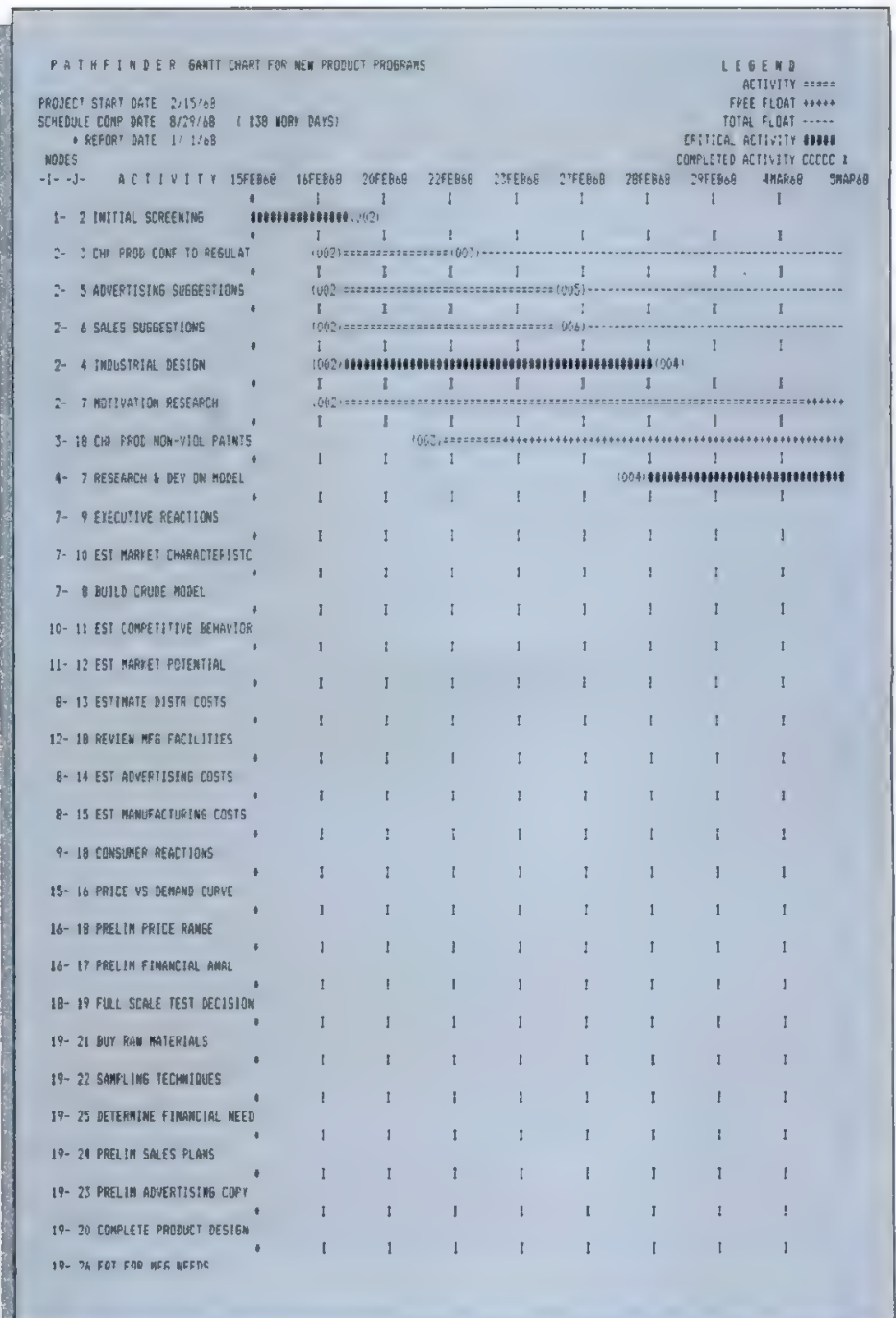
Of the reports called for in the case study, *Pathfinder* could produce only the task list, Gantt chart, and funding schedule. It could not produce a PERT chart, resource list, manpower loading chart, or holiday calendar. However, in addition to the task list, *Pathfinder* also produces a schedule report showing the start times it computed for each of the tasks. For any single report, you can request up to four schedule reports, each with a different sort sequence.

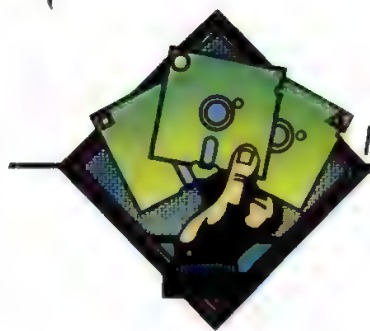
Adding, deleting, and inserting tasks can be done quickly and efficiently. It took me only 5 minutes to enter the changes and another 15 minutes to regenerate the schedule and print the schedule report.

The case study data were almost immediately usable. I didn't have to rearrange or recode anything except the assignment codes. These were given as alphabetic characters in the case study, and *Pathfinder* only accepts numeric entries for this code. However, the package couldn't handle a task duration of a fraction of a man-day, so I had to code the half-day tasks as one day each.

Pathfinder consists of four processing programs and a very simple help facility. Each of these programs is executed separately; there is no menu. The first program provides a question-and-answer dialogue for entering task information and report options. The second program uses the resulting project file to calculate the schedule and produce most of the reports. The

● The inclusion of free-float and total-float time complicates the presentation of this Gantt chart.





view indi-
screen. The
Gantt chart,
the printer.

caused prob-
mes with a cal-
years 1975 to
cter format, with

represented by a single

indicating that the day is a
work day, a Saturday, a Sunday, a
ward holiday, or a special holiday. To
change the calendar, you must use a text
editor. If you want to use this predefined
calendar file, you specify SYSTEM for
the calendar file in the project definition. If
you want to use a different file, you enter
the filename instead.

In my first try, I missed the place in the
manual that said to use SYSTEM and used
the filename of the predefined calendar
file, PFCAL. When I tried to run the
schedule calculation program, I got a disk
error message. Looking at the sample
data, I saw my mistake and changed the
calendar filename to SYSTEM. When I
tried the schedule program again, I got a
FORTRAN run-time abend. This time the
problem was that the calendar file did not
include the 1968 time frame required by
the case study. So I used a text editor to
build a new calendar. Although it was dif-
ficult to put the file together, when I was
finally finished the schedule program ran
without a hitch.

I'm sure that most people will use the
calendar file provided with *Pathfinder* and
will not encounter these problems. None-
theless, the program's response to the mis-
takes I made was totally inappropriate.

Pathfinder requires an IBM PC with
MS-DOS, at least 128K RAM, two dou-
ble-sided disk drives, and a 132-column
printer. An 80-column printer will work

just fine if you put it in compressed print-
ing mode before you get into *Pathfinder*.
The program stores the project file on the
same disk as the *Pathfinder* system and
uses the other disk for temporary work
files. It cannot take advantage of a color
monitor or a plotter, nor can it interface
with another software package.

Pathfinder is, for the most part, an
automatic Gantt chart drawing tool. It's
easy to use (as long as you don't have to
create your own calendar file). The major
weakness is that there is no system output
that conveys the dependency relationships
among tasks. At a price of \$299, *Pathfind-
er* is no bargain. —Leslie K. Brown

HARVARD PROJECT MANAGER: WINDOWS AND A ROADMAP

Harvard Project Manager, Version 1.12

Harvard Software, Inc.
521 Great Rd.
Littleton, MA 01460
(617) 486-8431

List Price: \$395

Requires: 128K RAM, two disk drives.

CIRCLE 748 ON READER SERVICE CARD

Harvard Project Manager is a pro-
gram that makes project planning
accessible to everyone. It allows
you to plan a project visually by graphi-
cally showing the relationships of various
project tasks and events. Moreover, the
program effectively uses cursor position-
ing to let you create a system of lines and
rectangles such as a PERT diagram, called
the "roadmap" to your project. The *Har-
vard Project Manager* is a combination of
logical and graphic relationships that facil-
itates creativity—an important ability in
today's software market.

GETTING STARTED

Two short programs must be executed
to get the system up and running. The
installation program simply copies DOS
onto the program disk. Printer installation
requires entry of the command "printer"

followed by the printer name. The program may be used with a hard disk system, but the hard disk will only hold project data; the program must be run off the program disk in the A: drive.

The program is copy protected, so the disk cannot be copied. However, Harvard Software, Inc., sends you a backup copy of the program disk when it receives your software registration card.

Harvard Project Manager comes with a fantastic tutorial that makes mastering the program in under 2 hours easy and almost fun. The tutorial consists of seven workshops—each instructing you to read sections from the manual, run demonstration programs in which all the keystrokes are entered for you, and then return to the manual to finish the demonstration on your own.

The documentation includes a reference card and a well-designed reference manual with attractive graphics and two-color printing. However, in spite of all its gloss and structural correctness, the manual is the program's Achilles' heel. It is brief to a fault; 90 percent of its explanation of how the program works is contained in the demonstration tutorials—not a good format for easy reference.

THE CASE STUDY

It took almost 2 hours—longer than for other packages—to enter the case study. Remember, however, that much of the preparation work had already been done before we began entering the case study data. If you were entering a new project from scratch with *Harvard Project Manager*, you should be able to spend less time in forethought and jump right in, letting the package help you actively plan the project as you go along. *Harvard Project Manager* requires that you enter activities and milestones on the roadmap, or PERT diagram. It has the most interactive entry system we've seen.

The program allows easy insertion or deletion of tasks and automatically adjusts the project plan accordingly; it redraws the roadmap to accommodate new activities. Milestones are represented by a box; activities are depicted by a box in reverse video. To delete a task, you simply place the cursor on the task box, and then with two keystrokes, it's gone.

Harvard Project Manager produces a variety of reports. The roadmap and the Gantt chart can be printed either normally or sideways. The sideways mode is unreasonably slow, but the reports are attractive

in the normal mode and a piece together without the ture.

In addition to creating a Gantt chart for each project, *Project Manager* also produces report and a status report. The detail lists all the information the program about your project, including each activity and milestone followed by all the information you've entered plus the information it has calculated, such as early finish dates. The status report lists information about selected activities and milestones. Using the sort function key you can specify which item of information you want the order of the report to be based on. You can extract lists based on the responsibility, slack time, or code field.

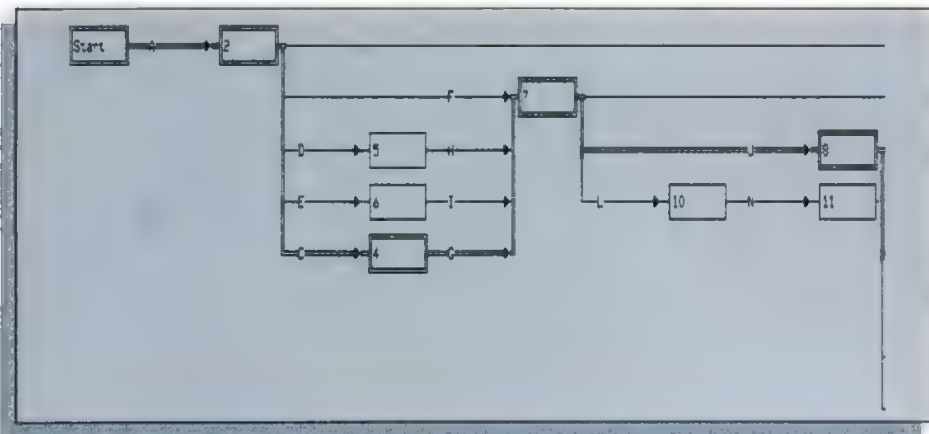
You can also print out the calendar for the project. Projects can be printed to disk in a DIF format to be used by spreadsheet programs.

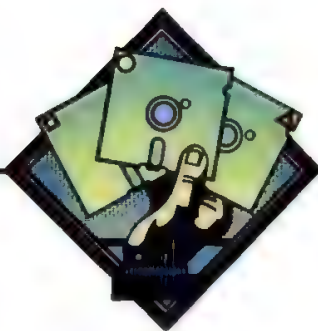
FEATURES

Harvard Project Manager does not deal as thoroughly with the planning of resources and their related costs as some other project planners. With this package, only fixed costs may be assigned to each activity—you cannot enter individual rates per resource. This limitation is unfortunate, and it will undoubtedly discourage from using the program those who rely heavily on flexible resource cost projections.

With the exception of inadequate resource scheduling, this product has many outstanding features. In addition to the graphic entry of project data we men-

● This is a typical critical path method diagram, which identifies each task in the entire path.





tioned earlier, the program allows up to four "windows" to be displayed on the screen at one time. For example, while you are looking at the PERT chart, the bottom window may contain the "node description," allowing you to see the data for each activity and milestone as you scroll along the roadmap. Or, you could display the roadmap and the Gantt chart simultaneously; even the project calendar may be viewed. This window feature comes in very handy—you can, for example, keep the node description window active while studying the PERT diagram.

Furthermore, *Harvard Project Manager* allows the entry of subprojects into the main project roadmap. A subproject is simply a sequence of activities stored as a project in a file of its own, then referenced in a larger project's plan by one activity box. This is an important feature because it lets you easily build a library of subtasks that will be used repeatedly. It also means that the number of activities you may have in a single project is limited only by disk space.

You can track the progress of your project in two different ways. One way is to enter the actual start dates and actual completion dates of each activity; the program then adjusts the project plan to reflect the impact of actual completion times on the remainder of the project. Progress can also be tracked by entering the percentage of completion of each activity.

SUMMARY

Of all the project planning software available for the PC, *Harvard Project Manager* has probably attracted the most attention. Its use of windows and a graphic interface makes it stand out from the herd

of logically correct, boring-to-use packages currently available. It is not a perfect package, but it is easier to use than most other products. With the exception of resource cost management, it performs all

the essential aspects of detailed project planning. It's a good value for the money, so we expect it to remain among the leading packages for quite a while.

—Diane Burns and S. Venit

INTEPERT: A WELL- DOCUMENTED WINNER



IntePert, Version 1.1

Schuchardt Software Systems

515 Northgate Dr.

San Rafael, CA 94903

(415) 492-9330

List Price: \$195

Requires: 128K RAM, one disk drive,
80-column printer.

CIRCLE 751 ON READER SERVICE CARD

IntePert belongs to the InteSoft family of integrated software from Schuchardt Software Systems. You can purchase *IntePert* as a standalone product or as part of the Professional Series III, which also includes *InteCalc* and *IntePlan*. *IntePert* offers critical path analysis and generates PERT, Gantt, task, and time charts for each project. Combining it with the other two packages in the Professional Series, especially *IntePlan*, adds detailed resource-management capabilities. All the InteSoft programs share similar commands.

GETTING STARTED

Installation of the product is straightforward. The program disk is not copy protected, and it requires no special initialization to run on the IBM PC. I was able to get the program up and running in minutes. The documentation includes step-by-step instructions on the basic DOS

commands required to make a backup of the program disk, so even computer novices will find start-up painless.

The program supplies several sample projects, and the reference manual contains a thorough tutorial that demonstrates all the program's important features. Although its read-then-type-in-what-you-read format is not as much fun as tutorials that enter the keystrokes for you, it does ensure quick and thorough mastery of the program. The tutorial runs for seven chapters (almost half the manual) and requires at least 2 hours to complete. I found it well written, clear, and correct. It even included a good deal of background information

● Shown here is an example of a task versus completion-time schedule.

on the basics of project planning. The skillfully presented material won't bore old pros or intimidate newcomers.

The rest of *IntePert*'s documentation is also outstanding. The typeset reference manual is printed on high-quality paper in two colors, with index tabs separating the major sections. The manual is well organized and liberally sprinkled with examples of screens and exact keystroke sequences printed in a second color that allows them to stand out clearly. This design reflects careful thought, and other software documentation authors should take note of it.

In addition to the tutorial chapters, the manual has a reference section, appendixes, a glossary, and a detailed index. The appendixes include information on error messages and a detailed explanation of

how to transfer information from *IntePert* to other programs in the *InteSoft* series.

THE CASE STUDY

PC Magazine's case study required just over an hour to enter. Once you define the project, each task is entered separately. The program prompts you for the task name, description, start date, end date, duration, predecessor and successor tasks, and a resource code. Once you define the start date of the whole project, you don't have to enter any more dates or predecessor or successor activities on every task for the program to perform its calculations.

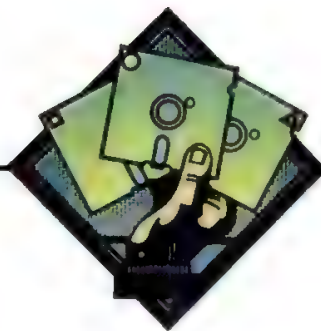
You can't enter tasks with zero duration: when I entered the "dummy" activities suggested by the case study, the program refused to calculate a schedule or critical path. I deleted these tasks and the

NEW PROJ CASE STUDY

```

02/15/85-02/16/85  02/17/85-02/22/85  02/23/85-03/10/85  03/11/85-03/20/85
--INITIAL SCREEN1--+-INDUSTRIAL DESI-----RESEARCH & DEVE--+-BUILD CRUDE OIL
Slack:  0 Days      | Slack:  0 Days      Slack:  0 Days      | Slack:  0 Days
|
|02/17/85-02/20/85
+-SALES SUGGESTION-
| Slack:  40 Days
|
|02/17/85-02/20/85
+-AD SUGGESTIONS---
| Slack:  40 Days
|
|02/17/85-02/25/85
+-MOTIVATION RESE-----+--ESTIMATE MARKET
| Slack:  13 Days      | Slack:  9 Days
|
|02/17/85-02/18/85  02/19/85-02/19/85
+-CHECK CONFORMAN-----CHECK PROD NON
Slack:  40 Days      Slack:  40 Days
|
|03/11/85-03/11/85
+-EXECUTIVE REACT
Slack:  12 Days

```



program performed the calculations flawlessly. When you insert or delete a task, *IntePert* automatically adjusts the rest of the project. Tasks are written to disk as you enter them. Other packages do this slowly, but *IntePert* writes the data without unreasonable delays.

FEATURES

IntePert uses spreadsheet-like slash commands, which are displayed at the bottom of the screen. Many of the legions of spreadsheet users would love to add project planning to their software libraries; *IntePert* can help ease the transition.

Once you enter the project data, *IntePert* generates a number of useful reports. Simply pressing a function key transforms your data into a PERT chart showing the critical path tasks across the top of the page. Another function key changes the screen display to a Gantt chart. Both kinds of charts can be printed with a single slash command. The charts don't use graphics characters, so they print quickly and don't require a special graphics printer. Although not particularly attractive, the reports are easy to read.

IntePert also generates a detail report, which lists the tasks and all the data available on each task. The resource chart generates a report for the schedule of each resource individually. The schedule report, which lists the activities by date, looks similar to the PERT chart but diagrams the information somewhat differently. Every task that begins on the 15th, for example, would be drawn across the page on the same row. The next row would contain tasks scheduled to begin on the 16th, and so on—a very useful way to view a project. Finally, the program prints a task chart, which lists the tasks by start date.

IntePert allows up to 64 hierarchical

levels, which means you can divide each task into a series of subtasks. This ability makes it a good program for dealing with relatively large, complex projects.

SUMMARY

At under \$200, *IntePert* is a good value. If it is representative of the *InteSort* series, I'd say that Schuchardt Systems has come up with a strong contender in the

integrated software race. I did not evaluate the portability of *IntePert* data into *IntePlan* or *InteCalc*, but the documentation suggests that data transfer should be simple and effective. (The program does not interface with any other brand-name spreadsheet or database software.) *IntePert* is a solid program that may be just the project management package to fit your needs. —Sharyn Venit

MICROGANTT: NICE FEATURES, BUT POOR DESIGN



MicroGANTT, Version 1.94A

Earth Data Corp.

P.O. Box 13168

Richmond, VA 23225

(804) 231-0300

List Price: \$395

Requires: 128K RAM, one disk drive.

CIRCLE 747 ON READER SERVICE CARD

Since project management on the microcomputer is a relatively new concept, many software packages, such as *MicroGANTT*, do only part of the job. *MicroGANTT* does Gantt charts and project budgeting but not PERT charts. The package has some good design features and will undoubtedly improve the management effectiveness of projects previously planned with pencil and paper.

FAST AND EASY

MicroGANTT is not copy protected so installation is fast and easy. No initialization of the program disk is necessary to run it. And since the program doesn't use graphics, its reports can be printed easily on any type of printer.

The manual supplies adequate information to get the program up and running but omits any type of detailed explanations.

No tutorial is provided. Several example projects are included on the program disk, and there are report printouts from the sample project files, but no explanations are given on any of them.

● *Very close to a classical Gantt chart, this presentation has the added capability of identifying critical tasks and illustrating priorities.*

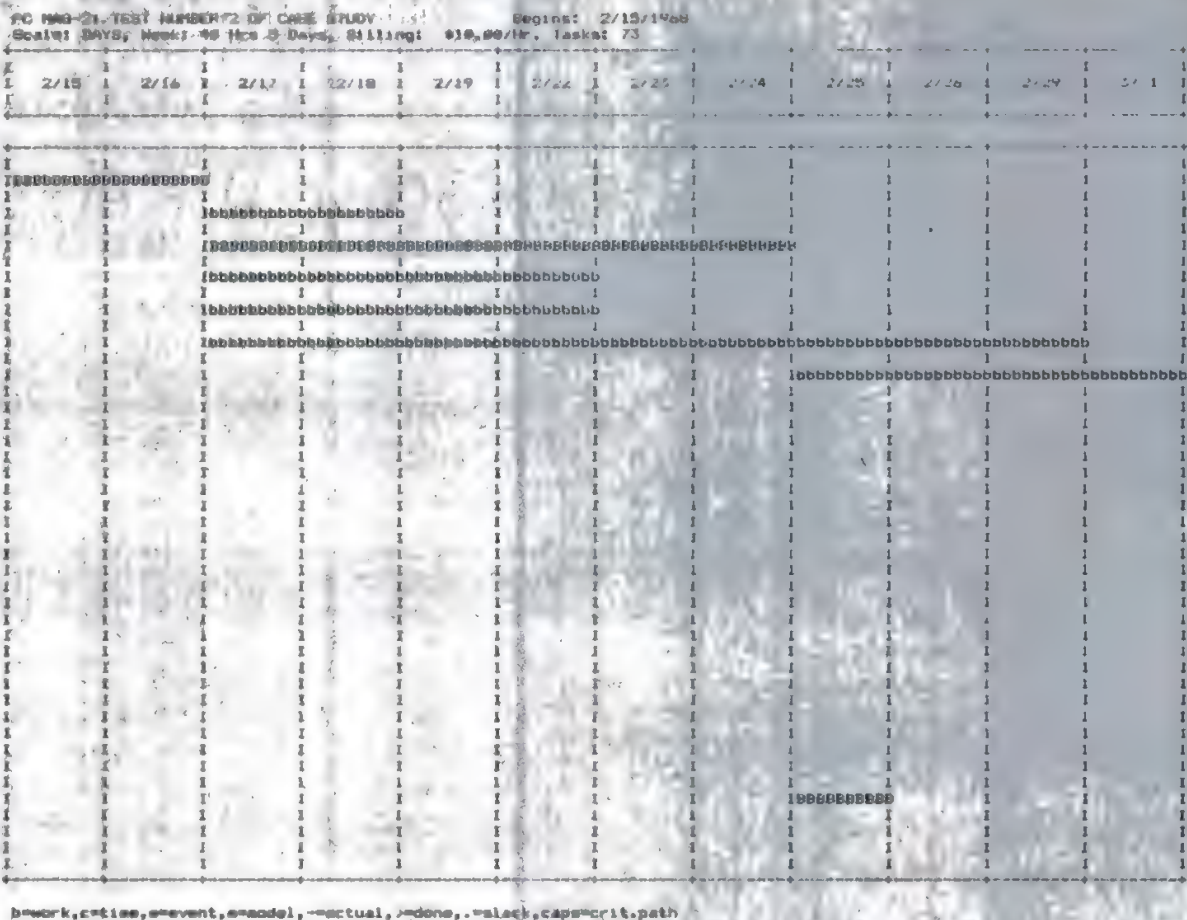
THE CASE STUDY

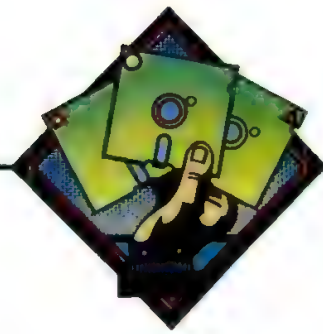
The case study was more time-consuming to enter than some of the other packages I reviewed because the PC data was set up to be entered into a network analysis format, which *MicroGANTT* does not accommodate. I had to spend more time preparing the data than with other packages. Once I had the project set up, it took me almost an hour to enter the data.

MicroGANTT writes each task to disk

as you enter it. While it saves time, it means you have to wait for that data to be saved after the entry of every task. And as the project lengthens, the time you have to wait after *each* entry increases. My final task entry in the case study took a full 10 seconds to save.

The case study did not take advantage of one of the strong points of *MicroGANTT*—budgeting. *MicroGANTT* allows you to assign a default hourly billing





rate to the entire project, plus it lets you override the default for each task necessary. The program also lets you assign fixed costs to each task.

MicroGANTT took 40 minutes to print the Gantt chart for the case study. Since it doesn't use any graphics, this seems like an inordinately long time. The program will also generate a detailed time/cost summary and a task summary.

Regarding the reports themselves—to use a line from the movie *The Wiz*, they “put the UGH in ugly.” I found them hard to read. The lines on the border of the chart are made up of capital I's. Each activity is represented by a letter of the alphabet instead of boxes; uppercase letters designate critical activities. While the letter system is a logical programmer's dream, it is totally unimaginative in terms of simplifying the presentation of complex data.

A FEW GOOD WORDS

MicroGANTT has a poor overall design, but it also has a few exceptionally well-thought-out features. The program is command driven. Commands are displayed on the screen at all times. It has two main programs on the disk, which are linked through their respective command menus—one program allows entry and modification of project data and the other outputs the various reports.

MicroGANTT not only allows for careful, detailed budgeting, but it also lets you include realistic work-loading in its project calculations through several important prompts in the project data entry. First, you are prompted for the time unit, such as day, week, and month, for each task and then for the expected duration of the task. These fairly standard entries are followed by a prompt for the number of

workers you will assign to that task and the percentage of their work allocation. For example, if you have a team of five people working on a task and you know they will be spending only 50 percent of their time on that particular activity, you can define accurate resource allocation.

Another good feature is that *MicroGANTT* allows the entry of a “composite task” or any project file on your disk. In other words, you can create Gantt charts for small segments of work that you do repeatedly for different projects and insert these into the appropriate points in a current project. It also extends the power to handle large projects effectively.

MicroGANTT stores its Gantt chart in BASIC format. These files may be used with any program with a BASIC interface. For instance, cost information may be read into Lotus's 1-2-3 for further analysis.

SUMMARY

While *MicroGANTT* has some good concepts, it offers no serious competition to the growing number of strong products in the project planning market. I think it is overpriced at \$395. To be competitive, the price should be slashed or the entire program should be redesigned, salvaging its few good features and scrapping the rest. —Diane Burns

MICROPERT 0: PROJECT NETWORK ANALYSIS



MicroPERT 0, Version 3.2

Sheppard Software Co.
4750 Clough Creek Rd.
Reading, CA 96002
(916) 222-1553

List Price: \$350

Requires: 192K RAM, one disk drive.

CIRCLE 745 ON READER SERVICE CARD

MicroPERT 0 (MP0) is a powerful tool for project network analysis. Originally designed for use on the Tektronix 4050 graphics computer in 1978, MP0 for the IBM PC was released in January 1983. The program requires a system with 192K RAM; two disk drives are recommended, but it will run with only one.

For what it does, the program performs well, but there are some important aspects of project planning that are neglected. You

can create a PERT chart by responding to a series of simple prompts about tasks and time. And then, with a few additional keystrokes, you can generate a Gantt chart, an activity list, and a resource list. *MPO* does not have the ability to include costs, and the entry of resources is awkward without the assistance of prompts. In addition, the program runs slowly, even on a hard disk system with 512K RAM.

QUICK START

MPO's installation is straightforward so I had the system up and running in a few minutes. However, I found it awkward

that every time you start the program you have to respond to a minimum of four entries just to see the opening system menu. Moreover, hard disk users, like myself, must perform six separate entries because the program never remembers what disk drive you want to use.

A tutorial is included and takes about an hour to follow, including entry of all project data. The tutorial sample project is easy to understand and gives you a basic idea of the program's capabilities. Furthermore, the accompanying explanations in the manual are presented well.

DOCUMENTATION

Every aspect of *MPO*, including error messages, is explained in a step-by-step manner. The 210-page manual is indexed,

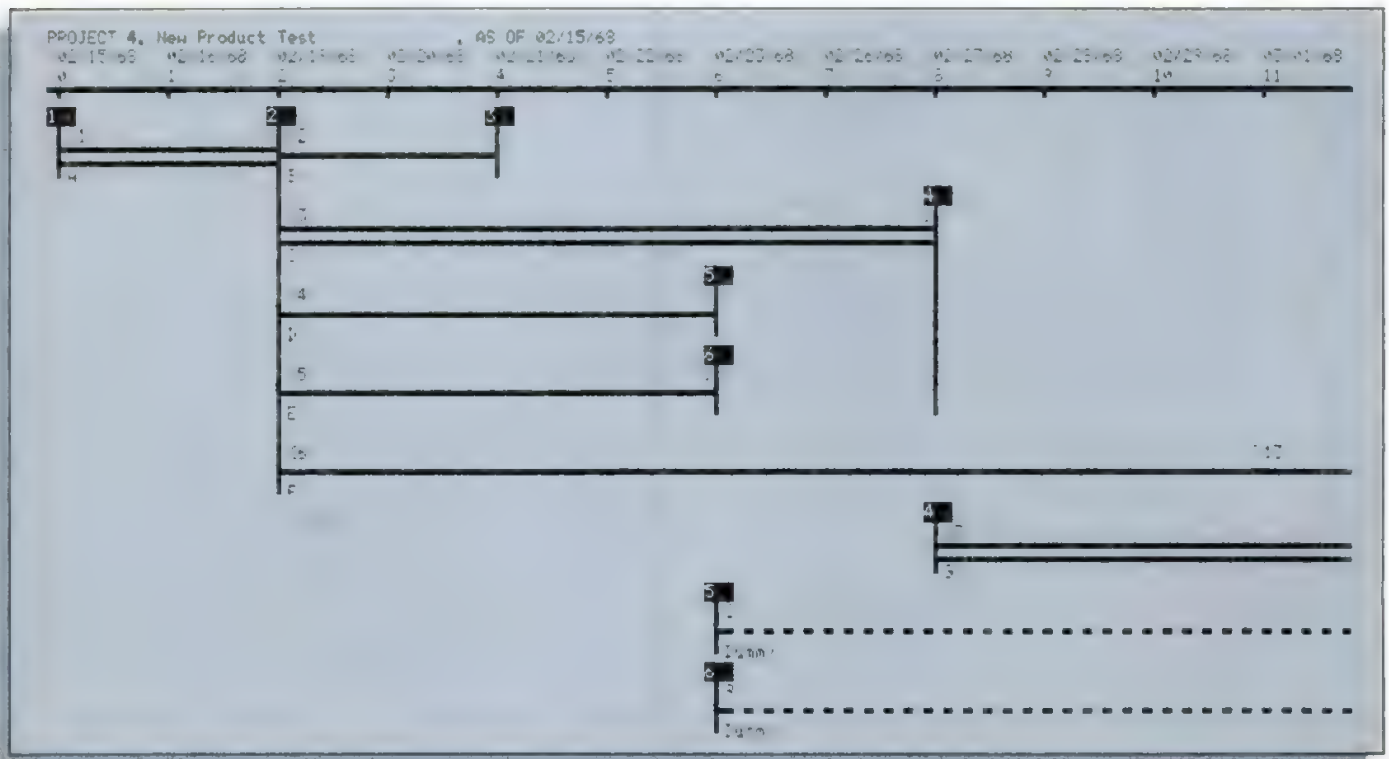
and the table of contents is complete. A good introductory section is also included for users who are reluctant to take the project planning plunge.

Technical support is available by phone, but the number is not toll-free. Updated versions of the software are sent to registered users for a nominal charge. A new version of the program is being written in the more efficient C language; it will replace the current compiled BASIC version and should reduce some of the response-time problems.

THE CASE STUDY

The case study was extremely easy to enter, taking approximately 30 minutes. Of course, the necessary preparation work, such as determining task relation-

● *This is a network diagram: it displays a time-scaled relationship between the tasks of a project.*



ships, was already done. When initially setting up a project, you will always have to do preliminary work before you can begin to enter the data. For example, you must determine the predecessor and successor of each task on paper first if the entry operation is to be efficient. *MPO* provides three worksheets to help you in this

ONE OF THE STRONG
FEATURES OF *MPO* IS A
POWERFUL, RESPONSIVE
EDITOR, WHICH ALLOWS
FOR THE DELETION,
INSERTION, OR
UPDATING OF ACTIVITIES
AND EVENTS.

process: an event list worksheet, an activity list worksheet, and a project layout worksheet.

One of the strong features of *MPO* is a powerful, responsive editor, which allows for the deletion, insertion, or updating of activities and events. Experimental situations may be tested by modifying data for individual tasks.

If an event is deleted, all activities that use the event must be updated to use a different predecessor or successor event. All subsequent events are automatically renumbered. When activities are deleted, no additional steps are required, but all activity relationships are recalculated and renumbered.

MPO produces a PERT chart, a Gantt chart, an activity list, and a resource list from the project data. There are a variety of print options available, including presentation or draft-quality printing, normal or compressed characters, and normal or sideways printing. Printing time in the

presentation mode is extremely slow; draft-quality printing is much faster and occurs at an acceptable speed.

FEATURES

MPO's system menu consists of 15 different selections, including Enter Project Data, Edit Project Data, Network Diagram, Gantt Chart, Utilities, and Help. Project data is quickly and easily entered. The first step is to enter the project size in terms of the number of events and the number of activities (tasks).

Next, the time period is established by entering the time unit and a multiplier. Standard time units are available (day, week, month, quarter, and year), and the multiplier gives the additional capability of increasing a time period to several units, such as 3 days or 2 quarters. Weeks may be defined by the number of days and by what day the workweek begins. The final time-related prompt asks for the date the project is to begin and the date of the report. There is no holiday calendar, so they must be entered as dummy activities.

Events are numbered automatically and may be given a description as well, if desired. Activities are also numbered automatically, and you enter them by inputting the predecessor event number, the successor event number, and then the duration of the activity. Several activities can use the same preceding event. Parallel finish times are established using a common successor event number.

Each activity description begins with a two-letter code, which you designate to identify a person or department. The program will then produce separate Gantt charts or schedule reports for each code.

PERT charts generated by this program use various symbols to indicate whether an

activity has started yet or whether it has been completed. The critical path is indicated on the screen and printouts by a double line, which appears in red on a color monitor. The Gantt chart indicates both the earliest and latest possible schedules, as well as the percent complete for each activity.

The program does not automatically save previous versions of the project. Comparisons with the original project plan may be obtained by either copying the project before revising it or by keeping a printout of the original.

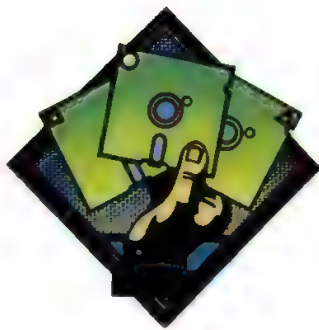
MPO is an effective package for network analysis and Gantt charting. The documentation as well as the overall design is well thought-out and thorough.

If you are not responsible for budgeting costs, *MPO* may be for you. However, make sure you have plenty of time to print in the presentation mode—unless, of course, you have a spooling program; there is no print spooling feature included

THE PROGRAM DOES
NOT AUTOMATICALLY
SAVE PREVIOUS
VERSIONS OF THE
PROJECT.
COMPARISONS WITH
THE ORIGINAL PLAN
CAN BE OBTAINED BY
KEEPING A PRINTOUT.

in *MPO*. *MPO* is a reasonable value for the price, but it needs some improvements to edge it further into this fast-growing, competitive project software market.

—Sharyn Venit



MICROTRAK: STRONG FOR SMALLER JOBS

PO

MicroTrak, Version 1.4C

SofTrak Systems

P.O. Box 22156 AMF

Salt Lake City, UT 84122

(801) 531-8550

List Price: \$595

Requires: 128K RAM, one disk drive,
two recommended.

CIRCLE 744 ON READER SERVICE CARD

MicroTrak is a no-frills software package that does on-screen and printed critical path analyses of small- to medium-size projects—constructing a half-mile sewer line, for example, as opposed to building a sewage treatment plant.

MicroTrak really only handles the back end of the planning task. Before you even approach the computer, you must manually break down the entire project into subsets of tasks and define task dependencies. However, once this is done, MicroTrak will help you develop a critical path for the project and keep track of expenses. MicroTrak also handles updates and schedule revisions automatically.

Getting started with MicroTrak is simple. You simply use the DISKCOPY command to create working backups or the COPY command to move MicroTrak files onto a bootable disk. To its credit, MicroTrak's publisher does not bog down the program with fumbling copy-protection schemes, but rather devotes 10 pages of documentation to explaining the dire consequences of illegal copying.

The system I received for review was already configured for the PC screen and keyboard as well as for the Epson MX—or IBM—printers, so I had to spend only 5 minutes on installation.

While MicroTrak does not come with

an on-line tutorial, the documentation does include an 11-page introduction to the basics of critical path method precedence scheduling. Since each scheduling software product tends to use slightly different terminology, reading this section of the documentation is a must before you start to use MicroTrak.

To the extent that this section of the documentation is a "tutorial," it is relatively easy to read and can be digested in 10 minutes. It does seem to assume, however, that you have some experience with scheduling theory.

The "basics" section is the best part of the documentation I read. The rest is skimpy and does not do justice to the product. It consists of 55 pages of text plus a series of plates showing MicroTrak's menus. Since 11 of these pages are devoted to planning basics and 12 pages are devoted to the user license, little seems to be left to help you use the program other than a cursory description of how to enter activities and other planning elements into the system.

MicroTrak's charts and their symbology, for example, are not discussed at all in the manual. This omission is a major defect in the documentation, since the network chart itself is so complex that its components cannot be fully understood without study. An interpretation of this chart's layout and symbology would be a significant addition to the manual.

THE CASE

The PC Magazine Lemon Computer Company case study required about 3 hours on MicroTrak. The system was able to handle a full component of holidays and all ten of the labor resources specified in the PC case.

Each task could also be preceded by up to ten other tasks, so there was plenty of

power to handle the PC test.

Entering the 83 activities in the PC task consumed most of the 3 hours. *MicroTrak* updates itself as activities are entered (much in the way a spreadsheet recalculates as entries are made). You can disable

**TO ITS CREDIT,
MICROTRAK'S PUBLISHER
DOES NOT BOG DOWN
THE PROGRAM WITH
FUMBLING COPY-
PROTECTION SCHEMES,
BUT SPENDS 10 PAGES
OF DOCUMENTATION
EXPLAINING THE DIRE
CONSEQUENCES OF
ILLEGAL COPYING.**

the recalculation feature, cutting your input time in half, but since the screen then goes blank so you cannot see what is going on, you would have to be absolutely sure that your entries were correct before you would want to do this.

MicroTrak allows three relationships between adjacent activities—finish to start, finish to finish, and start to start.

A finish-to-start relationship is one in which a preceding task must be finished before a following task can be started (a wall must be built before painting can begin).

A finish-to-finish relationship requires that one job be completed before another

● This project schedule in tabular form identifies critical and non-critical activities as well as lead and lag times.

SCHEDULE: Lemon Computer				BASE DATE = 15FEB85						
RUN DATE = 29JUL84 Rev 1				DATA DATE =						
NETWORK REPORT by TOTAL FLOAT				CUT OFF DATE =						
PREDECESSOR NO. AND DESCRIPTION				REL	LEAD	LAG	DAYS	-----DATES-----	TOTAL	
ACTIVITY NO. AND DESCRIPTION				TYPE	TIME	TIME	LEFT	START	FINISH	FLOAT
SUCCESSOR NO. AND DESCRIPTION										
1700	Ship to distributors	0	0					26JAN87	0	
1710	Introduce new product					0	27JAN87	26JAN87	0	
1690	Sell to outlets	0	3					23JAN87	0	
1700	Ship to distributors	1	26JAN87	26JAN87					0	
1710	Introduce new product	0	0				27JAN87		0	
1660	Full scale manufacturing	0	0					19JAN87	0	
1670	Establish distributors	0	129					15JUL86	129	
1690	Sell to outlets	4	20JAN87	23JAN87					0	
1700	Ship to distributors	0	0				26JAN87		0	
1620	Set up equipment	0	3					08JAN87	3	
1630	Receive raw materials	0	1					12JAN87	1	
1640	Train workers	0	0					13JAN87	0	
1660	Full scale manufacturing	4	14JAN87	19JAN87					0	
1690	Sell to outlets	0	0				20JAN87		0	
1610	Hire workers	0	0					07JAN87	0	
1640	Train workers	4	08JAN87	13JAN87					0	
1660	Full scale manufacturing	0	0				14JAN87		0	
1190	Chk. prod. for pat violat	0	200					21FEB85	200	
1170	Consumer reactions	0	163					16APR85	151	
1200	Review manf. facilities	0	169					08APR85	169	
1180	Preliminary price range	0	0					06DEC85	0	
1201	Null	0	30					23OCT85	30	
1202	null					0	07DEC85	06DEC85	0	
1570	Design Label & Trademark	0	0					31DEC86	0	
1580	Financial funds flow	0	4					24DEC86	4	
1610	Hire workers	4	02JAN87	07JAN87					0	
1640	Train workers	0	0				08JAN87		0	
1540	Establish prices	0	0					22DEC86	0	
1550	Select promotional aids	2	23DEC86	24DEC86					0	

(Chart continues)

(Chart continues)

continued

1520	Establish prices	0	0	22DEC86	0
1530	Select advertising copy		1	23DEC86	23DEC86
1520	Establish prices	0	0	22DEC86	0
1560	Select media		1	23DEC86	23DEC86
1470	Determine seasonal demand	0	0	18DEC86	0
1540	Establish prices		2	19DEC86	22DEC86
1580	Financial funds flow	0	0	23DEC86	4
1550	Select promotional aids	0	1	23DEC86	0
1470	Determine seasonal demand	0	0	18DEC86	0
1520	Establish prices		2	19DEC86	22DEC86
1560	Select media	0	0	23DEC86	0
1530	Select advertising copy	0	0	23DEC86	0

(Chart ends)

is finished. (A work crew could begin filling up a trench while pipe is being laid, but the last of pipe must be laid before it is closed.)

In a start-to-start relationship the preceding task must be started before the following task can be started. (Using the analogy above, a start-to-start relationship exists between the digging of the trench and the laying of the pipe.) The system often enables you to add lead or lag time to an activity or to specify starts "not earlier than . . ." and finishes "not later than . . ." a particular date. Although all of these features are important in real-life planning, none were required by *PC Magazine's* test case.

To delete a task, you have only to press a delete key and supply the activity number. *MicroTrak* deletes the task, removes all dependencies on it, and recalculates the network. When I deleted a task from the *PC* case, it took about 5 seconds to get a new screen.

MicroTrak can handle over 300 tasks

on a double-sided, double-density data disk; however, as the documentation warns, you should frequently check the space you have left. If you try to add a task that won't fit, you cause an unrecoverable error. *MicroTrak* comes with a zap utility to close files after such an error, but data could be lost.

A program of *MicroTrak's* sophistication should really tell you at the outset how many tasks can be added and continually show you how much disk space you have left.

MicroTrak can be used on a hard disk, but it does not support directory paths. It passes up all opportunities to make special use of color or of input devices other than the keyboard.

A strong feature in the *MicroTrak* package is its smorgasbord of seven reports. It includes a schedule report, network report, time scale report, milestone report, update report, activity-within-resource report, and resource-within-activity report.

**MICROTRAK CAN
HANDLE OVER 300
TASKS ON A DOUBLE-
SIDED, DOUBLE-DENSITY
DATA DISK. HOWEVER,
YOU SHOULD
FREQUENTLY CHECK THE
SPACE YOU HAVE LEFT. IF
YOU TRY TO ADD A TASK
THAT WON'T FIT, YOU
CAUSE AN
UNRECOVERABLE ERROR.**

These reports can be generated singly or in a group by a single request from the main menu.

Since it is designed for medium-scale projects, its most significant constraint is its ten-resource limit. Most medium-scale projects should be able to live with the 300-activity limit.

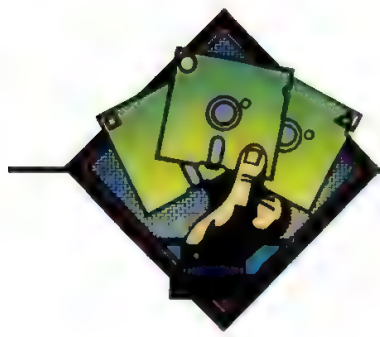
While this program does the job, its I/O—particularly the keyboard and screen routines—seems relatively unsophisticated compared with most current-generation software.

Its prompting is good, and errors are for the most part handled with a suggestion for correct input.

The documentation is definitely too sketchy, but *SoftTrak* promises new documentation soon. (To prove it, they showed me galleys of the new manual's table of contents.)

MicroTrak has many fine features and quite a bit of flexibility for its size, but I would recommend you see a demo before buying to be sure its talents and limits match the scope of your project.

—Richard Aarons



MILESTONE: A WELL-CRAFTED PLANNING SYSTEM



Milestone

Digital Marketing Corporation
2363 Boulevard Circle
Walnut Creek, CA 94595
(415) 947-1000

List Price: \$250

Requires: 128K RAM, one disk drive.

CIRCLE 743 ON READER SERVICE CARD

Milestone from Digital Marketing presents a good basic planning system for small and medium-size projects. It is written in USCD Pascal and will run on most 8- and 16-bit machines. Installation on 8-bit machines involves the typical setup of keyboard and screen functions; however, since the IBM PC version is preconfigured, it doesn't require any preparation other than making working backups.

TWO TUTORIALS

Milestone has two on-line tutorials. One is generic and acquaints the user with Digital Marketing's prompting system, which is used on most of its business products. The other includes an on-line sample construction project accompanied by an explanation in the manual.

The generic tutorial on *Milestone's* input system takes about 5 minutes. Basically, this screen-oriented input system requires the user to tab from menu item to menu item and edit the value shown. When the value is correct, it is accepted by tabbing or hitting the A key for "accept." The input scheme feels quite natural to me and, in my opinion, reduces input time and errors by anticipating appropriate responses and adding them to the prompt line.

Milestone's other tutorial takes about

20 minutes for you to go through the sample problem and try all of *Milestone's* bells and whistles. This tutorial is easy to understand and covers all of the product's features.

Milestone's manual is excellent. It is readable, well coordinated, easy to use, and comprehensive. Furthermore, examples and discussions of all of *Milestone's* reports are keyed to the sample problem in its tutorial.

THE CASE STUDY

Preparation for the case study required only 10 minutes, but it took about 2 hours to enter the project activities and their dependency factors and relationships, which are necessary so a critical path can be established for you to follow. *Milestone* allows only finish-to-start relationships, which are all the case study requires; however, some systems also support start-to-start and finish-to-finish relationships. A

MILESTONE IS A WELL-CRAFTED AND STURDY PRODUCT THAT IS IDEALLY SUITED FOR SMALL- TO MEDIUM-SIZE TASKS—THAT IS, FOR BUILDING A GARAGE AS OPPOSED TO BUILDING AN APARTMENT BUILDING.

finish-to-start relationship requires that you finish one phase of a project before you can start another phase.

The number of activities that can be handled by *Milestone* is dependent on memory capacity. In the CP/M system,

Lemon Computer, Revision 2, 2/15/84
Prepared by Dick Aarons

Job Description	Feb								
	15	16	17	20	21	23	24	27	28
	0	1	2	3	4	5	6	7	8
1 Initial Screening
2 Check prod. conformance
5 Sales suggestions
8 Null1	X
4 Advertising suggestions
3 Industrial Design
7 Research and Development
6 Motivation research
9 Null2
12 Estimate markets
14 Estimate comp behavior
15 Estimate market potential
19 Null4
10 Build crude model
13 Null3
16 Estimate distribution
20 Null5
17 Estimate add costs
21 Null6
18 Estimate mfr costs
11 Executive reactions
22 Price vs. demand curve
23 Prelim. financial analysis
24 Null7
26 Prelim price range
28 Review mfr facilities
25 Consumer reactions
27 Check prod for non violation
29 Full scale test desc.
34 Prelim sales plan
30 Complete prod design
37 Engineering lab test
31 Buy raw materials
38 Null
32 Sampling techniques
36 Equip for mfr needs
39 Set up mkt samples
42 Null
40 Mkt test forms prepared
33 Prelim ad copy
43 Manufacture models
45 Null

(Chart continues)

44 Test interviewers	.	.	.	.	.	.	.	.	.	.
46 Investigate distribution	.	.	.	.	.	.	.	.	.	.
48 Train interviewers	.	.	.	.	.	.	.	.	.	.
41 Prelim. media eval.	.	.	.	.	.	.	.	.	.	.
78 Select distribution channels	.	.	.	.	.	.	.	.	.	.
61 Determine serv. needs	.	.	.	.	.	.	.	.	.	.
49 Market tests	.	.	.	.	.	.	.	.	.	.
50 Code & Tabulate test	.	.	.	.	.	.	.	.	.	.
51 Evaluate test results	.	.	.	.	.	.	.	.	.	.
52 Mail	.	.	.	.	.	.	.	.	.	.
53 Improve product	.	.	.	.	.	.	.	.	.	.
55 Establish qual. cont.	.	.	.	.	.	.	.	.	.	.
56 Determine fin. needs	.	.	.	.	.	.	.	.	.	.
57 Plan manufacturing	.	.	.	.	.	.	.	.	.	.

(Chart ends)

● This is another critical path Gantt chart with average presentation and illustration.

job capacity ranges from 83 on a North-Star 56K RAM system to 190 on a Digital Research 64K RAM system. On the IBM PC with 448K RAM, *Milestone* can handle over 300 tasks. And *Milestone* lets the user know at all times how many jobs are left for assignment.

Milestone allows only 12 holidays and nine resources, so it fell a little short in both areas in the case study. In practice, you would have to combine resources if you needed more than nine and add holidays during a subsequent update if the number required exceeded 12. However, neither of these restrictions should create too many problems in the average small-to-medium-size planning job. Time can be measured in hours, days, weeks, months, quarters, or federal fiscal quarters. Four reports are available, including a project description report, a job description report, a time schedule report, and a columnar job report. The time schedule report is the traditional Gantt chart showing the critical path, which lists normal tasks and their lag times.

A QUICK SCROLL

Milestone is designed to run on a 128K RAM PC with two double-sided, double-density drives. It runs well on a hard disk drive but does not support directory paths. Output is to a standard parallel or serial printer and monochrome screen. You input with the keyboard only and with no special devices.

A strong feature of *Milestone* is its quick screen scroll—both vertically and horizontally. Some packages scroll vertically only one job at a time and scroll horizontally only one work period, such as a day, at a time. You can scroll any number of jobs or work periods instantaneously by entering a number before the scroll command. *Milestone*'s scroll feature makes on-screen analysis of the Gantt chart practical and greatly enhances task input.

Another nice feature of *Milestone* is that it presents on-screen real-time financial information in a histogram format. This feature lets the user see the critical path, job loading, and cash flow at a glance.

In normal operations, error handling is straightforward, with good prompting. However, I did get a surprise when I attempted to enter a 1969 date and ended

up with a program crash. As an explanation, the screen flashed an "integer overflow" plus a memory location where it all happened. This information is interesting to a programmer, but I suspect a planner would rather see a message explaining that

**A STRONG FEATURE OF
MILESTONE IS ITS QUICK
SCREEN SCROLL—BOTH
VERTICALLY AND
HORIZONTALLY. YOU
CAN SCROLL ANY
NUMBER OF JOBS
INSTANTANEOUSLY.**

Milestone will accept only dates after January 1, 1980.

Milestone is a well-crafted and sturdy product that is ideally suited for small- to medium-size tasks—that is, for building a garage as opposed to building an apartment building. Its documentation provides enough introductory information on planning theory to make *Milestone* useful even to users who are not familiar with analytical planning methods.

—Dick Aarons

In the 92 seconds it find any file you need



Ampex 20 MB hard disk with 25 MB tape backup.

*IBM-PC is registered trademark of IBM. *Apple II and IIe are registered trademarks of Apple Computer. *PC

takes to read this ad, on our backup streamer.

⌚ In the 1 hour, 4 minutes other streamers take, you could call your broker. Linger over coffee. Wade through the Wall Street Journal. ⌚ And read this PC Megastore ad too. ⌚ So take the time.

You'll more than make it up with a PC Megastore hard disk and tape hooked to your IBM-PC® or compatible, Apple II or IIe®, because all the files you need—both current and archive—will always be right where you need them.

⌚ Just a keystroke away. ⌚ The secret? Only Ampex backs up a 20 MB hard disk with another 25 megabytes* of addressable storage—a unique, bootable streamer with cache memory. That not only means you can address a file in 92 seconds, you can backup files offline just by touching a couple of buttons. ⌚ Without tying up your computer. ⌚ Your time. ⌚ Or a small fortune in floppies. (In fact, our 45 megabytes of available storage cost about half the price per MB of other hard disks.) So consider your time, money and convenience. ⌚ And our quality. PC Megastore is backed by a full year warranty from Ampex, a company known for manufacturing quality computer peripherals for over 20 years. ⌚ Take a moment to call us at 800 421-6863, or 213 640-0150 in California. Or write: Ampex Computer Products Division, 200 N. Nash St. MS M-11, El Segundo, CA 90215. We'll give you a dealer's name so you can buy PC Megastore. ⌚ Then in no time at all, you'll make up for the 92 seconds you spent reading this ad.

AMPEX
Ampex Corporation • One of The Signal Companies



NAME	HARDWARE REQUIREMENTS			DOCUMENTATION	
	MEMORY	NUMBER OF DISK DRIVES REQUIRED	FIXED DISK REQUIRED	HAS TUTORIAL	GIVES SAMPLE DATA
CPM/PERT	128K	1	NO	NO	YES
DATA*EASY PROJECT MANAGEMENT	128K	1	NO	NO	NO
DEMI-PLAN	128K	1	NO	YES	NO
EMPACT	192K	1	NO	YES	YES
EX-PERT/80	64K	1	NO	Yes, combined with reference manual	YES
GARLAND PATHFINDER	128K	2	NO	NO	NO
HARVARD PROJECT MANAGER	128K	2	NO	YES	YES
INTEPERT	128K	1	NO	YES	YES
MICROGANTT	128K	1	NO	NO	YES
MICROPERT 0	192K	1, but 2 recommended	NO	YES	YES
MICROTRAK	128K	1, but 2 recommended	NO	YES	NO
MILESTONE	128K	1	NO	YES	YES

SYSTEM CAPACITIES

NUMBER OF RELATED PROJECTS	TASKS PER PROJECT	LEVELS OF HIERARCHY	RESOURCE CATEGORIES	SCHEDULING UNITS	MAXIMUM \$ AMOUNT	TASKS DISPLAYED SIMULTANEOUSLY
1	600	1	None	Days	14 digits	18
1	7	1	None	Days	Not applicable	7
1	100	1	1	Days; can scale in weeks	Not applicable	1
1	250	1	Unlimited	Days	No costing done	13
1	999	1	1	Numbered	Not applicable	18
1	2,000	1	30 per project, 1 per task	Days	No maximum	1
Can relate unlimited number as subprojects	200 per subproject	Limited by disk capacity	None	Variable from seconds to years	\$999,999.99	9-12
Can relate 1,200-1,900 as subtasks	Can relate 1,200-1,900 as subtasks	64	26	Days, weeks, months, years	Not applicable	20
Can relate unlimited number as subprojects	100	Limited by disk capacity	Unlimited	Hours, days, weeks, months, quarters, years	\$99,999,999	11
1	220	1	Not applicable	Days, weeks, months, quarters, years, or numbered	Not applicable	28
1	300	1	10	Input: days. Output: days, weeks, or months	\$9,999 per resource per day	18
1	250	1	9	Hours, days, months, quarters, federal fiscal quarters	\$9,999,000	16



NAME	FEATURES				
	COPY PROTECTED	MIXED PLANNING UNITS	CHANGES PLANNING UNITS	ON-LINE HELP	CRITICAL PATH HIGHLIGHTED
CPM/PERT	NO	NO	NO	Yes, with split-screen	Yes, by special symbol
DATA*EASY PROJECT MANAGEMENT	NO	NO	NO	NO	Yes, by graphic density or user-defined code
DEMI-PLAN	NO	NO	NO	NO	Yes, printed on Gantt chart with character "C"
EMPACT	NO	NO	NO	Yes, context-sensitive	NO
EX-PERT/80	NO	NO	NO	NO	Yes, by asterisks
GARLAND PATHFINDER	NO	NO	NO	NO	Yes, by "CRT"
HARVARD PROJECT MANAGER	YES	YES	YES	Yes, context-sensitive	Yes, by a double line
INTEPERT	NO	YES	YES	Yes, context-sensitive	Yes, across top of network diagram
MICROGANTT	NO	YES	YES	Yes, with split-screen	Yes, by upper case
MICROPERT 0	YES	NO	YES	YES	Yes, by double line or color
MICROTRAK	NO	NO	NO	NO	Yes, by double line on screen, by boldface on printer
MILESTONE	NO	NO	NO	NO	Yes, by double line

INPUTS						
CHARACTERS ALLOWED IN TASK DESCRIPTION	ALLOWS TASK ESTIMATES	DEFINES TASK DEPENDENCY		INSERTS TASKS	READJUSTS DEPEND- ENCIES	MULTIPLE BILLING RATES
		AS PERCENTAGE OF TASKS COMPLETED	AS NUMBER OF TASKS COMPLETED			
20	YES	NO	NO	YES	YES	NO
12	NO	NO	NO	NO	NO	NO
20	NO	NO	NO	YES	YES	NO
24	NO	NO	NO	YES	NO	NO
No task description	YES	NO	NO	YES	YES	NO
24	NO	NO	NO	YES	YES	NO
255	NO	NO	NO	YES	YES	NO
60	NO	NO	NO	YES	YES	NO
40	NO	YES	1-4 per event	YES	YES	NO
30	NO	NO	NO	YES	YES	NO
28	NO	Yes, in time units	10	YES	YES	NO
32	NO	NO	NO	YES	YES	NO



NAME	OUTPUTS				
	PROJECT PLAN/TASK LIST	NETWORK ANALYSIS	GANTT CHART	PERT CHART	RESOURCE LIST
CPM/PERT	Yes, on screen and printer	NO	Yes, on screen, printer, and plotter	NO	NO
DATA*EASY PROJECT MANAGEMENT	Yes, on screen and printer	NO	Yes, on screen and printer	NO	NO
DEMI-PLAN	Yes, on screen and printer	NO	Yes, on printer	NO	Yes, on screen and printer
EMPACT	Yes, on screen and printer	NO	Yes, on screen and printer	NO	NO
EX-PERT/80	Yes, on screen	Yes, on screen	Yes, on printer	NO	NO
GARLAND PATHFINDER	Yes, on printer	NO	Yes, on printer	NO	NO
HARVARD PROJECT MANAGER	Yes, on printer	NO	Yes, on screen and printer	Yes, on screen and printer	NO
INTEPERT	Yes, on screen and printer	Yes, on screen and printer	Yes, on screen and printer	Yes, on screen and printer	Yes, on screen and printer
MICROGANTT	Yes, on screen and printer	Yes, on screen and printer	Yes, on screen, printer, and plotter	NO	Yes, on screen and printer
MICROPERT 0	Yes, on screen and printer	Yes, on screen and printer	Yes, on screen and printer	Yes, on screen and printer	Yes, on screen and printer
MICROTRAK	Yes, on screen and printer	Yes, on screen and printer	Yes, on screen and printer	NO	Yes, on screen and printer
MILESTONE	Yes, on screen and printer	NO	Yes, on screen and printer	NO	Yes, on screen and printer

						VENDOR SUPPORT
FUNDING SCHEDULE	MANPOWER LOADING	HOLIDAY CALENDAR	SUB- CONTRACTS	UPDATED PROJECT PLAN	UPDATED NETWORK ANALYSIS	HOT-LINE TECHNICAL SUPPORT
NO	NO	Yes, on screen and printer	NO	NO	NO	YES
NO	NO	NO	NO	NO	NO	YES
NO	Yes, on printer	NO	NO	NO	NO	YES
NO	NO	Yes, on screen and printer	Yes, on screen and printer	Yes, on screen and printer	NO	YES
NO	Yes, on printer	NO	NO	NO	NO	YES
Yes, on printer	NO	NO	NO	NO	NO	NO
NO	NO	Yes, on screen and printer	NO	NO	NO	YES
NO	Yes, on screen and printer	NO	NO	NO	NO	YES
Yes, on screen, printer, and plotter	Yes, on screen, printer, and plotter	NO	Yes, on screen and printer	NO	NO	YES
NO	NO	NO	Yes, on screen	NO	NO	YES
Yes, on screen and printer	Yes, on screen and printer	Yes, on screen	NO	Yes, on screen and printer	Yes, on screen and printer	YES
Yes, on screen and printer	Yes, on screen and printer	Yes, on screen and printer	NO	NO	NO	YES



NAME	INTERFACING		BUYING INFORMATION		
	WITH OTHER FAMILY SOFTWARE	WITH OTHER TYPES OF SOFTWARE	LIST PRICE	DEMO VERSION AVAILABLE	AVAILABLE OUTSIDE OF U.S.
CPM/PERT	NO	NO	\$249	YES	YES
DATA*EASY PROJECT MANAGEMENT	NO	NO	\$50 plus \$2 shipping	Yes, to dealers	NO
DEMI-PLAN	NO	NO	\$49.95	NO	YES
EMPACT	NO	NO	\$149.95	YES	Yes, except in Australia and Japan
EX-PERT/80	NO	NO	\$115	NO	YES
GARLAND PATHFINDER	NO	NO	\$299	YES	YES
HARVARD PROJECT MANAGER	NO	Yes, DIF format output	\$395	YES	YES
INTEPERT	Yes, with <i>InteGraph</i> , <i>IntePlan</i> , <i>InteCalc</i> , and <i>InteMate</i>	NO	\$195	NO	Brazil, Europe, Australia, South Africa
MICROGANTT	NO	Yes, has BASIC interface	\$395	YES	YES
MICROPERT 0	NO	NO	\$350	YES	YES
MICROTRAK	NO	Yes, <i>dBASE</i>	\$595	Yes, for \$50	YES
MILESTONE	NO	NO	\$250	Yes, to dealers	YES

AND NOW THE GAME BEGINS

The PERSONAL COMPUTER *Game*

BUSINESS EDITION

INTRODUCING THE AT&T



PERSONAL COMPUTER.

The personal computer game is ready for business—and now it's your move. To win the game your company needs a fast, flexible, reliable personal computer that enables you to call the shots.

Go directly to the new AT&T Personal Computer.

The AT&T Personal Computer is more than just a superior piece of hardware. Behind it is a commitment to a better way of managing information and communications. One that can pay off handsomely in increased productivity and profits.

Because our AT&T PC is designed to be flexible enough to meet all your business needs—today and in the future.

Whether you use it as a stand-alone workstation or as a team player in a fully integrated system, you'll find our PC a high-performance machine. And a hard-working addition to your office.

Its fast processing and high-resolution graphics will help make any computer task a computing pleasure. In addition, you can expect more standard features. More expansion slots. More options for future growth.

OFF-THE-SHELF SOFTWARE DOES THE JOB

Driven by the MS-DOS* operating system, the AT&T PC runs the most popular off-the-shelf software for a wide range

of business applications. Financial analysis. Forecasting. Budgeting. Word processing. Inventory. The AT&T PC does it all.

And its flexibility means that when it's time to expand, our PC will actually make your computer growing pains painless.

With our unique PC Interface it can be linked to the more sophisticated, higher capacity world of the UNIX** System V Operating System—the AT&T Computer “brain” that is emerging as the operating system standard for multi-user, multi-tasking machines.

THE AT&T TRADITION CONTINUES

Some things about our PC cannot be measured in bits and bytes, but are of immeasurable value.

For instance, the unmatched service and support of AT&T. The built-in reliability—and outstanding quality—of our products. The century-long tradition of technological innovation and personal attention to detail.

Think about it. Then make your move—to the AT&T Personal Computer, from AT&T Information Systems.

To get in on the game, call your AT&T Account Executive, visit an Authorized AT&T PC Dealer, or call 1 800 247-1212.

**AT&T INFORMATION SYSTEMS.
WHEN YOU'VE GOT TO BE RIGHT.**



*MS-DOS is a trademark of Microsoft Corporation.
**UNIX is a trademark of AT&T Bell Laboratories.
©1984 AT&T Information Systems



The six word processing programs reviewed here give budget-conscious PC users something to cheer about. Each costs less than \$100, runs on a single disk drive, and requires 128K RAM or less.

WORD PROCESSING ON A BUDGET

W

WORD PROCESSING
MARILYN V. FLEMING

Word processing wizards may swear by *WordStar* or other sophisticated word processing software, but if your needs are basic and your wallet is thin, you may be interested in programs that won't cost hundreds of dollars. *Friendly Writer*, *Personal Editor*, *QUICK-TEXT*, *QUICK-TEXT II*, *The Word Worker*, and *I-EDIT* are six such packages. Each costs \$100 or less and runs on a single disk drive. None requires more than 128K RAM, and, with the exception of *Personal Editor* and *The Word Worker*, each is easy to use.

I compiled a list of common features and gave some thought to what functions were particularly useful or important, such as being able to transport files between applications and computers and having screen-editing capability. *Personal Editor* and *I-EDIT* are ASCII files, which makes transporting files no problem; *QUICK-TEXT*, *QUICK-TEXT II*, and *Friendly Writer* offer the option of working with document or nondocument files, and *QUICK-TEXT*

(both versions) provides a special interface for *WordStar* and *EasyWriter* files. *The Word Worker* does not allow any but its own files to be used. Most of the packages have a screen-editing capability, except for *The Word Worker*, which is the only package to offer just a line editor. The screen editor offered by *Personal Editor* is superb.

Generally, I was impressed with the quality of these six programs. Knowing that many word processing packages sell for over \$300, I was surprised to find that these six selling for less than \$100 compared so favorably. A brief review of each package follows.

Friendly Writer

Although it can be used for general-purpose word processing, *Friendly Writer* is designed for the writing, filing, and accessing of letters. Users are given little flexibility in defining text area because pages and margins are defined by a choice of three sizes—8½ by 11, 8½ by 14, and 5

WORD PROCESSING

by 7—rather than by column position for the left and right margins. There may be no more than 78 characters per line, and the document size is limited by available memory. There is no provision for chaining files for printing. The status line on the screen lets you know what line, page, and character position you are on and how many lines are still available before memory is exhausted.

The tab, search, and special print features are limited. Tabs cannot be set; striking the Tab key inserts five blank spaces in the text. To move more than five spaces, you must press the Tab key again; to move less, you must delete the extra spaces. The search function finds the defined string and offers you the opportunity to replace each occurrence, but it does not let you define the replacement string for automatic replacement. Ranges of text can be identified for underlining, but other special print features, such as boldface and double strike, are defined at print time and apply to the entire document. The document attributes—spacing, margins, and so forth—are conveniently saved and automatically reloaded with the document. Reformatting is as simple as changing the document format settings.

The spelling checker, *Friendly Speller*, is one of the best I have seen. Documents are quickly and accurately checked for spelling errors. The option for a display of alternative spellings helps find the correct spelling for words misspelled in text. To correct words, you simply select the correct alternative or enter the correct spelling in the text yourself. Moreover, if the word is one that you will be using repeatedly, you can immediately add it to the auxiliary dictionary. You can also import "foreign" files for spelling correction or for editing as a *Friendly Writer* document. When I tried this with a *WordStar* document, the only casualty was the loss of all paragraph indentations.

Friendly Writer supports 49 printers; FriendlySoft urges you to call if yours is not on its list. The company says it will "add printers to the list frequently, and an

update that supports your printer may be available."

FriendlySoft offers a "No Fine Print" guarantee, which states that the company will replace your master disk at no cost if it fails during normal use; if it is damaged because of abnormal use, it will replace it

FriendlySoft offers a
"No Fine Print"
guarantee, which
states that the
company will replace
your master disk at
no cost if it fails
during normal use.

at no charge in return for a blank, unformatted disk. In either case, you must return the original, damaged disk. And if you have problems using the software, there is a 24-hour hotline.

Personal Editor

Personal Editor is a screen editor with comprehensive editing functions. There may be up to 255 characters per line, and the size of any document or file is limited by available memory and disk space. If *Personal Editor* runs out of memory space, it will create a "spill file," which may contain up to 128K.

I didn't find the *Personal Editor* to be well adapted to word processing. The package can be tailored to meet most document and text-handling requirements, but you must be willing and able to modify it. I think the program has been ingeniously designed to make the tailoring a fairly simple procedure—one of the appendixes even provides the command file and key definitions that the author used to set up the word processor when he was writing the reference manual. However, the novice PC user may be intimidated by the

reprogramming requirement.

Noteworthy features of the *Personal Editor* include its ability to edit up to 20 files simultaneously, to move or copy blocks of text between files, and to undo a mistaken deletion; the automatic saving of the last five changes on a user-accessible file; and the MACRO and DEFINE commands. The *Personal Editor* comes with certain functions assigned to various control keys. The DEFINE command allows you to assign new or different functions to various control keys, and the MACRO command lets you set up files of commands that can be saved and executed when accessed. Thus, you can set up a macro containing the commands needed to turn the *Personal Editor* into a word processor.

While there are no defined functions for page eject and underlined or emphasized printing, there is a function allowing you to embed printer commands in the text and thereby take advantage of all the special printer functions that are available on your machine, such as italics, compressed and enlarged print, and optional character sets.

Personal Editor is a powerful, flexible, and comprehensive text-editing program that can be made into a satisfactory word processor, but in order to use it effectively, you must be fairly comfortable with your PC.

QUICK-TEXT

QUICK-TEXT is a general-purpose word processing package that provides most word processing functions. The maximum line size is 80 characters, and, while the size of each file is limited by available memory, there is a print-chaining function that allows you to link several files for printing.

I didn't like the fact that you can't tell what page you are on while writing the document. However, an especially helpful feature is the command that enables you to automatically reverse the order of the two characters immediately to the left of the cursor—a tremendous aid to users who

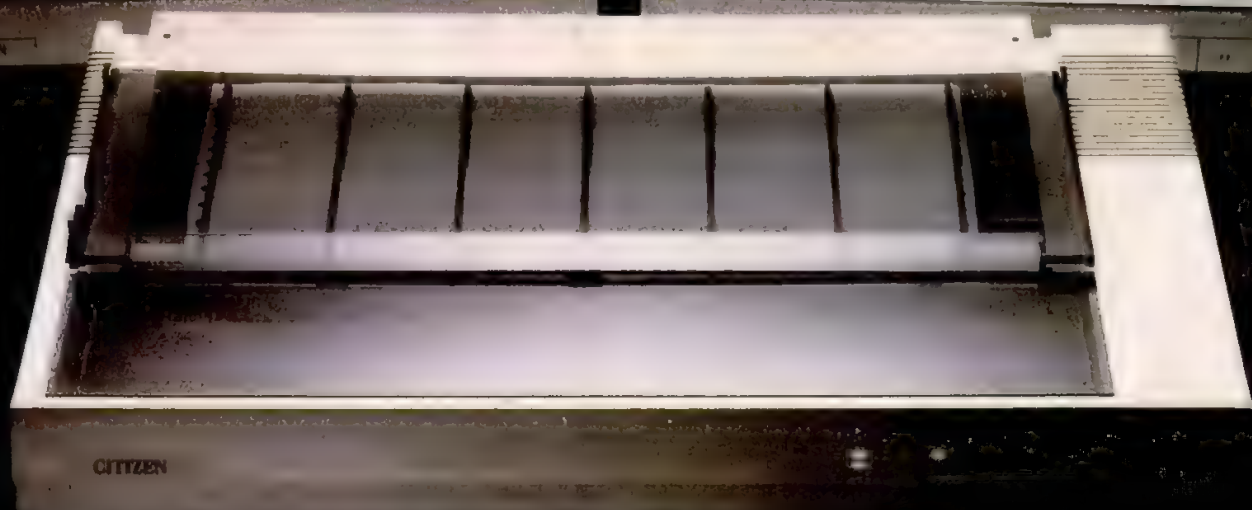
WORD PROCESSING

Comparative Analysis of Six Inexpensive Word Processors

	Friendly Writer \$89.95	Personal Editor \$100.00	QUICK- TEXT \$55.00	QUICK- TEXT II \$70.00	Word Worker \$49.95	I-EDIT \$30.00
COST						
DOCUMENT ENTRY FEATURES						
Maximum line length	78	255	80	253	130	80
Automatic word wrap	yes	yes	yes	yes	yes	yes
Set margins	page size	yes	yes	yes	yes	yes
Tab set	5 spaces	yes	yes	yes	yes	yes
Set line spacing	yes	no	yes	yes	yes	yes
Right-margin justification	yes	no	yes	yes	no	yes
Center text	yes	yes	yes	yes	yes	yes
Reformat text	yes	yes	yes	yes	yes	yes
Ruler line	no	no	yes	yes	no	no
Status display (column, line, and page)	yes	col/ line	col/ line	col/ line	no	line
DOCUMENT EDITING						
Character						
● Insert	yes	yes	yes	yes	yes	yes
● Delete	yes	yes	yes	yes	yes	yes
Delete word (single command)	yes	no	no	no	no	yes
Line and block						
● Delete	yes	yes	yes	yes	yes	yes
● Copy	yes	yes	yes	yes	yes	yes
● Move	yes	yes	yes	yes	yes	yes
Find string	yes	yes	yes	yes	yes	yes
Replace string with defined string	no	yes	yes	yes	yes	global
Scrolling	yes	yes	yes	yes	no	yes
Save recent changes	no	yes	no	no	yes	yes
FILE HANDLING						
Retain document attributes when saved	yes	no	yes	yes	yes	no
Save selected blocks	no	yes	yes	yes	yes	no
Copy other files into document	no	yes	yes	yes	WW files	yes
Change document name	yes	yes	no	no	yes	yes
Automatic backup	no	no	no	no	no	yes
List of available files	yes	yes	yes	yes	WW files	yes
DOS interface						
● ERASE	FW files	yes	yes	yes	yes	no
● RENAME	no	yes	yes	yes	no	no
● COPY	FW files	yes	yes	yes	no	no
DOCUMENT PREVIEW ON SCREEN (on screen as on printer)	no	no	no	no	no	yes
SPELLING CHECKER INCLUDED	yes	no	yes	yes	no	yes

(continued)

CITIZENS
AGAINST UGLINESS,
UNRELIABILITY,
HASSLES AND
HIGH PRICES.



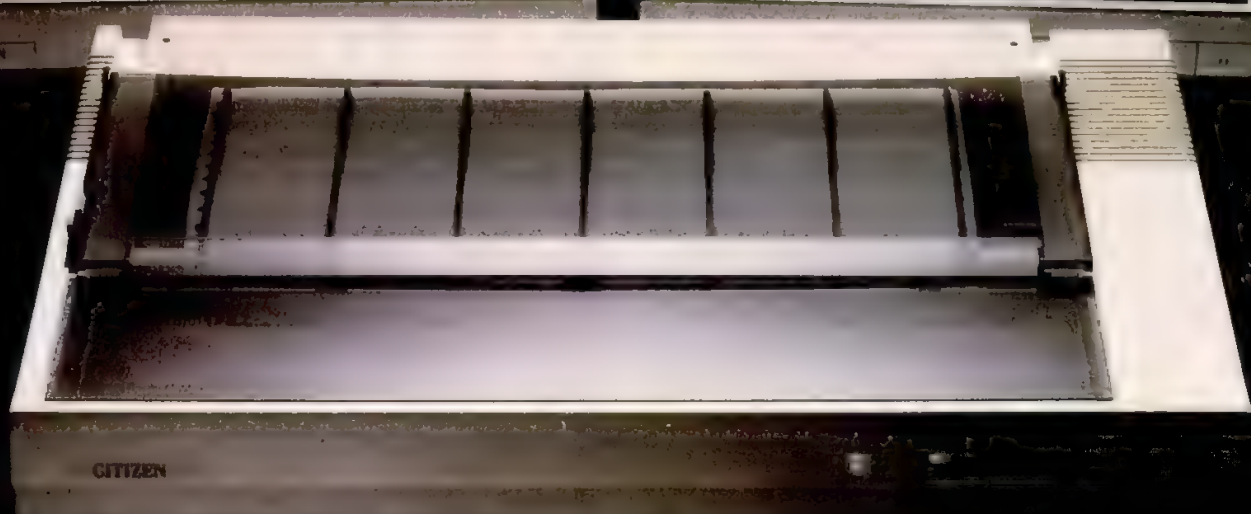
WORD PROCESSING

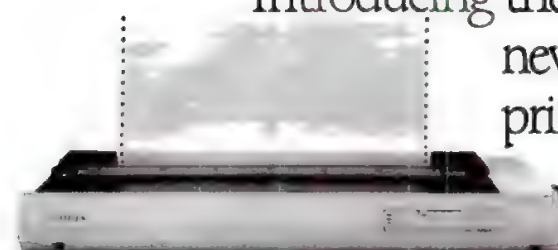
Comparative Analysis of Six Inexpensive Word Processors

	Friendly Writer \$89.95	Personal Editor \$100.00	QUICK- TEXT \$55.00	QUICK- TEXT II \$70.00	Word Worker \$49.95	I-EDIT \$30.00
COST						
DOCUMENT ENTRY FEATURES						
Maximum line length	78	255	80	253	130	80
Automatic word wrap	yes	yes	yes	yes	yes	yes
Set margins	page size	yes	yes	yes	yes	yes
Tab set	5 spaces	yes	yes	yes	yes	yes
Set line spacing	yes	no	yes	yes	yes	yes
Right-margin justification	yes	no	yes	yes	no	yes
Center text	yes	yes	yes	yes	yes	yes
Reformat text	yes	yes	yes	yes	yes	yes
Ruler line	no	no	yes	yes	no	no
Status display (column, line, and page)	yes	col/ line	col/ line	col/ line	no	line
DOCUMENT EDITING						
Character						
● Insert	yes	yes	yes	yes	yes	yes
● Delete	yes	yes	yes	yes	yes	yes
Delete word (single command)	yes	no	no	no	no	yes
Line and block						
● Delete	yes	yes	yes	yes	yes	yes
● Copy	yes	yes	yes	yes	yes	yes
● Move	yes	yes	yes	yes	yes	yes
Find string	yes	yes	yes	yes	yes	yes
Replace string with defined string	no	yes	yes	yes	yes	global
Scrolling	yes	yes	yes	yes	no	yes
Save recent changes	no	yes	no	no	yes	yes
FILE HANDLING						
Retain document attributes when saved	yes	no	yes	yes	yes	no
Save selected blocks	no	yes	yes	yes	yes	no
Copy other files into document	no	yes	yes	yes	WW files	yes
Change document name	yes	yes	no	no	yes	yes
Automatic backup	no	no	no	no	no	yes
List of available files	yes	yes	yes	yes	WW files	yes
DOS interface						
● ERASE	FW files	yes	yes	yes	yes	no
● RENAME	no	yes	yes	yes	no	no
● COPY	FW files	yes	yes	yes	no	no
DOCUMENT PREVIEW ON SCREEN (on screen as on printer)	no	no	no	no	no	yes
SPELLING CHECKER INCLUDED	yes	no	yes	yes	no	yes

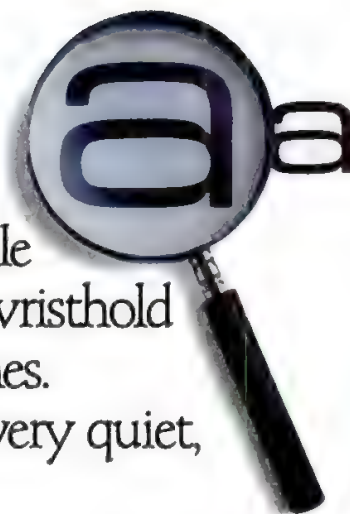
(continued)

CITIZENS
AGAINST UGLINESS,
UNRELIABILITY,
HASSLES AND
HIGH PRICES.






Introducing the Citizens. A whole new line of dot matrix printers, precision-engineered by the people who've become a wristhold word in fine, precision-engineered watches.



The Citizens are very sleek, very quiet, and reliable as the day is long.



They're IBM® or Epson® compatible, with output speeds of 160 cps, or 40 cps correspondence-quality at the flick of a switch.

They're also exceptionally easy to use, thanks to our unique new push-feed paper loading system.

And if all this weren't enough to tick off the competition, wait 'til you see what a value Citizen™ is for the money.

Stop by one of our dealers today and watch what the Citizens can do for you.

For more information, call 1-800-556-1234, Ext. 34. In California, 1-800-441-2345, Ext. 34.

Or write Citizen America Corporation, 2501 Colorado Avenue, Santa Monica, CA 90404.

CITIZEN

© 1984 Citizen America Corporation. Citizen is a trademark of Citizen America Corporation. IBM is a registered trademark of International Business Machines Corporation. Epson is a registered trademark of Epson America, Inc.

CIRCLE 113 ON READER SERVICE CARD



WORD PROCESSING

constantly transpose characters.

The spelling checker that comes with the package is better than no spelling checker, but not by much. The dictionary has the articles *the* and *a* but it leaves out the pronoun *he* and the conjunction *and*. The checker is evoked during document entry; it will check only one word at a time and will not provide a display of alternative spellings. If you want to add words, you must make a note of them and run the dictionary update program once you have finished with your document.

Several features have been included to make *QUICK-TEXT* compatible with other packages, including the ability to easily create nondocument files and a special interface to directly read *WordStar* and *EasyWriter* Version 1.1 document files through recognition of a WS or EWF filename extension.

The package also has some nice form-handling features. You can number pages, define headings or footnotes to automatically print on selected pages, chain other documents to be printed sequentially, and

set the printer margin (used in addition to the document margin) to start a new page where appropriate.

QUICK-TEXT II

QUICK-TEXT II has all the features of *QUICK-TEXT* plus the following important additions: the maximum line size is increased to 253 characters; DOS 2.0 sub-directory support has been included; and you can use up to four printers. For example, you can have both a dot matrix and letter quality printer attached and you can direct your document to be printed by either one. In addition, *QUICK-TEXT II* has the capability to print from the editor without first having to save the document.

In addition, three other new features more than justify the \$15 price increase. The text merge feature allows you to create form letters or other form documents. Then, with the variable input feature, you can create a data file that has, for example, the names and addresses of agents to whom you wish to send a book proposal.

You can then construct your proposal to accept the names and addresses from the variable input file and insert them in the document when they belong. Now, you can type one form proposal that can access a file of 25 prospects and print 25 personalized proposals. The envelope feature lets you create an envelope to be associated with your document file that you can edit and print as appropriate.

In short, while *QUICK-TEXT II* requires more memory than other packages reviewed here, it does provide all the fundamental word processing functions along with some sophisticated ones.

The Word Worker

The Word Worker's 500-page manual explains the steps for selecting a computer and a printer and shows you how to write a word processing application for it. The application is, of course, *The Word Worker* programs that come with the manual, including a fundamental word processing routine that provides rudimentary writing, editing, and printing capability; an en-

(Comparative Analysis Chart continued)

	Friendly Writer	Personal Editor	QUICK- TEXT	QUICK- TEXT II	Word Worker	I-EDIT
DOCUMENT PRINTING						
Print selected pages	no	no	yes	yes	yes	no
Page numbering	no	no	yes	yes	yes	yes
Multiple copies	no	no	yes	yes	no	yes
Print before save	yes	yes	no	yes	yes	yes
Interface with various printers	yes	yes	yes	yes	yes	yes
Underline	yes	no*	yes	yes	yes	line*
Bold or double	document	no*	yes	yes	no*	line*
Superscript/subscript	no	no*	no	no	no*	no*
Footnotes and headers	no	no	yes	yes	yes	no
Top of form control	no	no*	yes	yes	yes	yes
Embedded printer control commands	no	yes	no	no	yes	yes
Text-merge and variable input	no	no	no	yes	no	no
Envelope utility	no	no	no	yes	yes	no
ON-SCREEN HELP						
Menu of available commands	yes	no	yes	yes	yes	yes
Accessible help file	yes	yes	yes	yes	yes	yes

*These features can be implemented by inserting the proper printer escape sequences.

Micro Flash is Reliable

- In our 4th year of business (*One of the Originals!*)
- Positive buying power within the industry meaning well-stocked inventories and a consistent supply
- A reputation as specialists in the business and corporate marketplaces
- A dedicated approach to honest customer service

Micro Flash Guarantee

- We sell the latest versions
- We support what we sell
We won't tell you to call the publisher or manufacturer for after-sale support.
We want you to call us!
- We won't sell you anything we don't think you need
- If the product is defective when you receive it—we'll replace it!

Micro Flash Terms

- MasterCard or VISA—with no credit card surcharge added
- Mail Orders accompanied by certified or cashier's checks
- Call our Credit Manager for information on institutional purchase orders
- All returns must have a Return Authorization Number
- \$100.00 minimum order
- Products and prices subject to change without notice
- Corporate Discounts

Micro Flash Shipping

- \$6.00 for UPS surface (except for printers and monitors)
- Add \$3.00 per item for UPS 2nd Day Air
- All shipments fully insured at no extra charge
- Call for information on foreign orders, US Mail, CODs
- Overnight delivery service available

PRODUCTS FOR IBM PC & COMPATIBLES

HARDWARE & PERIPHERALS

	RETAIL PRICE	MICRO FLASH
Alloy PC +		
Hard Disk/Tape BU	\$4295.00	\$3600.00
AST Research SixPakPlus 64K	395.00	269.00
AST MonoGraph Plus		
(Lotus Compatible)	595.00	495.00
64K Ram Chip Sets "\$1 per K"	100.00	55.00
CDC 9409 DS/DD Disk Drive ..	525.00	195.00
Davong 10 MB External	2395.00	1795.00
Hauppauge Intel 8087 Chip ..	175.00	157.00
Hayes Smartmodem 1200 ...	899.00	489.00
Hercules Graphics Card	499.00	389.00
Microsoft® Serial Mouse	195.00	139.00
Plantronics Color Plus		
(Symphony Compatible) ...	580.00	389.00
Printers—Epson, Oki, Diablo, NEC, Toshiba, Brother, Others		\$CALLS
Princeton Graphics		
Max-12 Amber Monitor ...	249.00	189.00
HX-12 Hi-res RGB Monitor ..	895.00	524.00
SR-12 Super Hi-res RGB		
Monitor w/Scan Doubler ..	1048.00	843.00
PTI Datasheet Power Supply ..	359.00	329.00
Diskettes—3M, Dysan, Others		\$CALLS

SOFTWARE

Ashton-Tate dBase III	\$ 895.00	\$ 449.00
FRAMEWORK	895.00	489.00
BPI Systems Accounting* ea.	595.00	398.00
CYMA Shoebox Acctg Pkg ...	395.00	315.00
Human Edge Sales Edge	250.00	198.00
Microrim Inc. R:base 4000 ...	495.00	315.00
Microsoft® Multiplan™*	195.00	139.00
Multi Tool™ Word	375.00	249.00
Multi-Tool™ Word with Mouse	475.00	298.00
Multi-Tool™ Cash Plan	125.00	94.00
Basic Compiler*	395.00	276.00
Business Basic Compiler ..	800.00	418.00
C Compiler	500.00	349.00
Pascal Compiler	300.00	224.00
Fortran Compiler*	350.00	244.00
Cobol Compiler*	700.00	518.00
Sort Facility*	195.00	148.00
Macro Assembler	100.00	74.00
Project	250.00	198.00
Microstuf Crosstalk XVI	195.00	119.00
MultiMate Word Processor ..	495.00	279.00
Peter Norton Utilities	80.00	55.00
RoseSoft ProKey	129.95	95.00

*Also available in Apple IIc Format

PRODUCTS FOR APPLE MACINTOSH

Davong MacDisk 10 MB	\$2395.00	\$2059.00
Haba Systems Habadex	200.00	159.00
Memorex 3½" Diskettes	69.95	49.00
Microsoft® Multiplan™	195.00	148.00
Basic Interpreter	150.00	122.00
Chart™	125.00	99.00
Multi Tool™ Word	195.00	148.00
Odesta Helix	395.00	299.00
PFS File & Report	195.00	149.00

Many other products available at comparable discounts! Quantity pricing available

For product information, price quotes, technical support please call

415/680-1157

inside California
800/457-2433

To order from outside California, call

800/458-2433

Telex # 353188 MFLASH UD



COMPUTER SYSTEMS, INC.

1110 Burnett Avenue, Suites J & K
Concord, CA 94520

Member: Better Business Bureau, Chamber of Commerce
Listed: Dun & Bradstreet

WHAT TO WEAR WHILE BALANCING THE BOOKS.

Go ahead. Slip into something comfortable. Wear the most comfortable, most sophisticated microcomputer accounting software in the world. Open Systems. Accounting software so rich in features, it can handle the complex problems of today's small business with unprecedented ease. Software so flexible, it runs on all popular microcomputers. And can grow right along with your business needs.

No other accounting software line is so complete. With a choice of General Ledger, Accounts Receivable, Accounts Payable, Inventory, Payroll, Job Cost, Sales Order, Purchase Order and Fixed Assets as well as a

Report Writer that links your accounting data to popular spreadsheets, word processors and graphics software. Assuring you the luxury of a perfect software fit.

The fact is, Open Systems meets the needs of today's small business so completely, it's become one of the best selling lines of accounting software on the market. More than 300,000 accounting products are providing comprehensive accounting solutions for businesses throughout the world. Now that's comforting. Call Open Systems right now. And get your mind off the books.

For the dealer nearest you call 1-800-328-2276

A man and a woman, dressed in formal evening wear, are seated at a table. The woman, with blonde hair and wearing a red dress and a pearl necklace, is looking down at a stack of three white software boxes labeled 'UCCEL'. The man, with dark hair and wearing a dark suit, is looking down at a manual or document on the table. The boxes and manuals are arranged on the table. One box is prominently displayed in the foreground, showing the 'UCCEL' logo and 'OPEN SYSTEMS' text. Another box is partially visible behind it, also labeled 'UCCEL'. A manual with the 'UCCEL' logo is lying flat on the table. In the bottom right corner, there is a small card that reads 'OPEN SYSTEMS The accounting software that makes you look good. UCCEL'.

CIRCLE 144 ON READER SERVICE CARD

OPEN SYSTEMS
The accounting
software that makes
you look good.
UCCEL

WORD PROCESSING

hanced writing program; an enhanced editing program; and an enhanced printing program. You are provided the BASIC source for these routines and are told how to modify them to suit your particular requirements. The manual is an excellent reference, and the programs provide an extremely powerful document-handling capability. However, unless you are quite comfortable with your computer and fairly adept with BASIC—or willing to become so—you are not going to be comfortable with this package. And, even if you are a computer whiz and know BASIC inside out, you will probably find the editing program frustrating—it is a line editor that allows only one editing function at a time, and the only way to copy or move blocks of text is to delete them and rewrite them from the delete “holding area.”

The program has been well designed for writing manuscripts and reports. The lines may be up to 130 characters long, and, while individual files are limited by available memory, the program will automatically store pages onto disk for long documents. It also offers a chaining function so these files can be automatically chained for editing and printing. There is a wide flexibility in page numbering and titling format, and there are utilities for handling footnotes and other special manuscript formatting requirements. You can also insert nonprinting notes to yourself to show where figures or tables should be inserted in the text. Moreover, you can insert special printer control sequences in the document as it is being created, so you can take full advantage of any special printing features your printer has.

I-EDIT, Version 2.11

I-EDIT processes and creates ASCII files so the documents created contain no special *I-EDIT* command sequences. Lines may be up to 80 characters wide, and, although document length is limited by available memory, a print-chaining function has been provided.

The application has been designed to serve as both a word processor, for the

creation and printing of documents, and as a screen editor, for the creation and editing of program files. I did not like the fact that the page number was not displayed on the screen during document entry and found it inconvenient that most scrolling functions were limited to the text displayed on the

screen. For example, the page up and page down function moves you from screen to screen. The capability to have the file printed to the screen for preview seemed a real asset until I discovered it scrolled by too fast to read. Because the document files are ASCII, printer control commands

Bargain Hunters Take Note

The following six low-cost word processors compare favorably to many more-expensive models.

Friendly Writer

FriendlySoft Inc.
3638 W. Pioneer Parkway
Arlington, TX 76013
(817) 277-9378

List Price: \$89.95

Requires: 64K RAM with DOS 1.x, 128K RAM with DOS 2.x, one disk drive, 80-character monochrome or graphics monitor.

CIRCLE 797 ON READER SERVICE CARD

Personal Editor

IBM Corporation
590 Madison Ave.
New York, NY 10022
(212) 407-3500

List Price: \$100

Requires: 64K RAM, one disk drive.

CIRCLE 798 ON READER SERVICE CARD

I-EDIT, Version 2.11

Innovative Technology Inc.
2387 Blackstone Crescent
Ottawa, Ontario
Canada K1B 4H3
(613) 521-8391

List Price: \$30 for executable copy, \$120 for source.

Requires: 64K RAM, one disk drive, 80-character monochrome or graphics display.

CIRCLE 799 ON READER SERVICE CARD

QUICK-TEXT

Distributed Software Systems, Inc.
950 Knollwood Dr.
Buffalo Grove, IL 60090
(312) 634-1511

List Price: \$55

Requires: 64K RAM, one disk drive.

CIRCLE 794 ON READER SERVICE CARD

QUICK-TEXT II

Distributed Software Systems, Inc.
950 Knollwood Dr.
Buffalo Grove, IL 60090
(312) 634-1511

List Price: \$70

Requires: 128K RAM, one disk drive.

CIRCLE 796 ON READER SERVICE CARD

The Word Worker

Design Enterprises of S.F.
P.O. Box 14695
San Francisco, CA 94114
(415) 282-8813

List Price: \$49.95

Requires: Microsoft BASIC, 64K or 128K RAM, one disk drive.

CIRCLE 795 ON READER SERVICE CARD

GREAT PRICES! GREAT SERVICE!

If you're looking for a great deal on business software, 800-Software is hard to beat. We became one of America's largest software marketers by offering great prices—and a lot more.

Here are some of the reasons to buy from 800-SOFTWARE:

■ **LOW DISCOUNT PRICES.** Generally 40-50% off suggested list price.

■ **FAST DELIVERY.** Our giant inventory makes this possible. (We can provide overnight delivery!)

■ **FREE TECHNICAL SUPPORT.**

Call our helpful and patient experts.

■ **RELIABILITY AND REPUTATION.**

Some of our best customers are America's biggest corporations, including IBM, Hewlett-Packard, G.E. and Honeywell. Also, we fully guarantee every product we sell against defects.

■ **EASY TERMS.** We accept purchase orders from qualified organizations.

CHECK OUT THESE INCREDIBLE SOFTWARE PRICES:

AMDEK™ MONITORS	CALL	MICROSOFT® WORD	
AST 6-PACK PLUS™	CALL	W/MOUSE	\$359
CROSSTALK™	\$105	MULTIMATE™	\$299
dBASE II/III™	CALL	MULTIPLAN™	\$149
EASYWRITER II		NORTON UTILITIES™	\$ 59
SYSTEM™	\$195	PFS: FILE/GRAPH/	
4-POINT GRAPHICS™	\$129	WRITE/REPORT™	\$ 95
FRAMEWORK™	\$409	QUICKCODE™	CALL
HAYES		RBASE 4000™	\$329
SMARTMODEMS™	CALL	SUPERCALC® 2	\$159
HERCULES GRAPHIC		SUPERCALC® 3	\$219
CARD™	CALL	WORDSTAR®	\$209
INFOSTAR™	CALL	WORDSTAR®	
IUS ACCOUNTING		PRO. PAK	\$299
MODULES™	\$299	VOLKSWRITER	
LOTUS 1-2-3/		DELUXE™	\$179
SYMPHONY™	CALL	PLUS MUCH, MUCH MORE!	
MAXELL™ OR MEMOREX™			
DISKETTES	CALL		

800-SOFTWARE IS READY TO SERVE YOU.

TO ORDER CALL TOLL-FREE: 800-227-4587 OR 415-644-3611

- ☐ Dealer inquiries welcome.
- ☐ Quantity discounts available through our National Accounts Program.
- ☐ Purchase orders accepted. Please call in advance.
- ☐ Call for shipping charges. Overnight delivery available.

- ☐ We do not add surcharge for credit card purchases.
 - ☐ Prices may change. Above prices are for IBM-PC and compatibles.
 - ☐ International orders welcome: TELEX #751743 800-SOFTWARE UD
 - ☐ CompuServe Key Word "GO-EH".
- CA residents add sales tax.
©Copyright 800-SOFTWARE 1984



800-SOFTWARE

940 Dwight Way, Berkeley, CA 94710

WORD PROCESSING

are entered as specially formatted lines of text or with the printer control escape sequences that *I-EDIT* allows you to insert in the text. While these features offer flexibility, they tend to make the printing of specially formatted documents a bit awkward.

I-EDIT offers some noteworthy editing features. You can transpose letters or words with a single command and sort several lines based on the value in a user-

You can add to the
I-EDIT dictionary
and even build
your own
dictionary files.

defined key field. You can also assign new definitions to the numeric and alphabet keys. Thus, if you wanted, you could have *personal computer* inserted in your text every time you pressed the Alt-P key combination. The new definitions assigned to these keys can be saved, along with document attributes, on a special file to be loaded with your document. In this way, you do not have to redefine them each time you reload the document.

The program includes a spelling checker, which will highlight all words on the screen not in the dictionary. You can add to the dictionary and build your own dictionary files.

I-EDIT was designed so that both document and program files could be created, and, because it handles only ASCII, it can interface freely with other applications.

If you're without a basic word processing capability, given the prices and selection, you won't go far wrong choosing from this low-budget list. ■

Marilyn V. Fleming is a computer specialist with the U.S. Army Corps of Engineers.

Command

Assist™

**YOUR
DOS MANUAL
ON
DISK
THERE
WHEN YOU
NEED IT!**



\$49.95

AVAILABLE ONLY FOR
IBM PC, XT AND
COMPATIBLES
USING PC/MS DOS
2.0 or GREATER

NOW TAKE COMMAND OF YOUR DOS

Now your DOS manual is available on disk! Think of it, no more searching or fumbling through hundreds of pages to find the command you need. Suppose you want to know how to use a DOS command, just type **HELP** and the command name. In the blink of an eye the information is on your screen, full instructions on how to properly use the command, complete with examples. Suppose you can't remember the command you want, just type **HELP** and all the commands are displayed on the screen in alphabetic order. Command/Assist gives you the ability to create custom help displays.

NOW YOU CAN TAKE COMMAND.

Micro Design International Inc.
6566 University Blvd., Winter Park, FL 32792 • (305) 657-6604

Outside U.S. add \$15.00 (Payment must be a bank draft payable in U.S. dollars.)

IBM, IBM PC, XT and PC DOS are registered trade marks of INTERNATIONAL BUSINESS MACHINE CORP.
MS DOS a registered trade mark of MICROSOFT CORP.

CIRCLE 167 ON READER SERVICE CARD

ORDER YOUR COPY OF Command/Assist TODAY!

For Visa and MasterCard orders call:

TOLL FREE 800-221-6444 Ext. 800

(OUR LINES ARE OPEN ANY TIME DAY OR NIGHT)

Dealer and Distributor inquiries welcome, Call: **TOLL FREE 800-327-1056 Ext. 5118/IN FLORIDA 800-432-8515 Ext. 5118**
Another quality product from **MICRO DESIGN INTERNATIONAL**
your internal Hard Disk solution.

Command/Assist \$49.95 Plus \$5.00 shipping and handling
COD orders add an additional \$2.50.

Certified Check M/O

MC/ VISA/

Expires

Name _____
Address _____
City _____
State/Zip _____

EVEREX

EVER for EXcellence



2 years
warranty!



Everex Storage Subsystems Plug Right Into Your Business!

Everex combines **Reliability, Support, Ease of Use and Best Price Performance Ratio** into a full product line of internal storage subsystems and plug-in controller cards. Now you have no excuse not to turn your IBM® PC into an XT! Actually, **more** than an XT, when you combine our **Half-Height** hard disk with our **Half-Height** streaming tape.

Hard to believe? Well, believe this, both the hard disk and streaming tape **Plug Right Into Your System**. Incredible? Unique? That's EVEREX for you.

Plug-in Subsystems

■ **Hard Disk Drive with Everex Controller Card** — we're offering you anywhere from 10-40MB of storage, in half or full height, that you can directly plug into your PC with **No Software Patch Required**. And we are so confident of our Hard Disk Drive that we are backing it with a **FULL TWO-YEAR WARRANTY***. All this starting at a **LOW** suggested retail of \$1,195!

■ **Streaming Tape with Everex Controller Card** — you get 20-45MB of high-performance back-up storage in minutes. And **REMEMBER**, this is a half-height streamer! The price is something to remember too — starting at **ONLY \$1,135** suggested retail.

Combined with the half-height hard disk, you've got something you can really talk about — an XT that backs itself. Only from Everex.

Controller cards sold separately:

■ **ULTRA DISK™** — Controls both the hard disk and floppy disk drives **at the same time**, saving you both space and money. Suggested retail — \$525.

■ **Floppy Disk Controller** — easy to install at \$220 suggested retail.

■ **Streaming Tape Controller** — direct plug-in and very reliable. Suggested retail — \$315.

Want to know more? Just ask your local dealer for all the details.

*Two-year warranty on Hard Disk Drive, one-year warranty on the controller card.

OEM Inquiries Welcomed.

Price subject to change without notice.



Everex Systems, Inc.

CIRCLE 14 ON READER SERVICE CARD

OEM and Dealer Hotline 800-821-0806. In California call 800-821-0807.

891 Maude Ave., Mountain View, California 94043 (415) 967-1495

IBM is a registered trademark of International Business Machines Corp.
Ultra Disk is a trademark of Everex Systems, Inc.

AD-X02

Super Software for Technical Investors

Market analysis software for the PC takes a quantum leap forward with *The Technical Investor* and *Winning On Wall Street*.

Analyzing Wall Street trends in depth is one of the most complex tasks you can undertake. There are so many variables to keep track of and so many possible courses for the future to take that the capability to create a coherent image of what lies ahead has been con-



The Technical Investor

Savant Software Corporation
P.O. Box 440278
Houston, TX 77244
(713) 556-8363

List Price: \$395

Requires: 128K RAM, two disk drives, modem, graphics-capable printer, and color/graphics adapter.

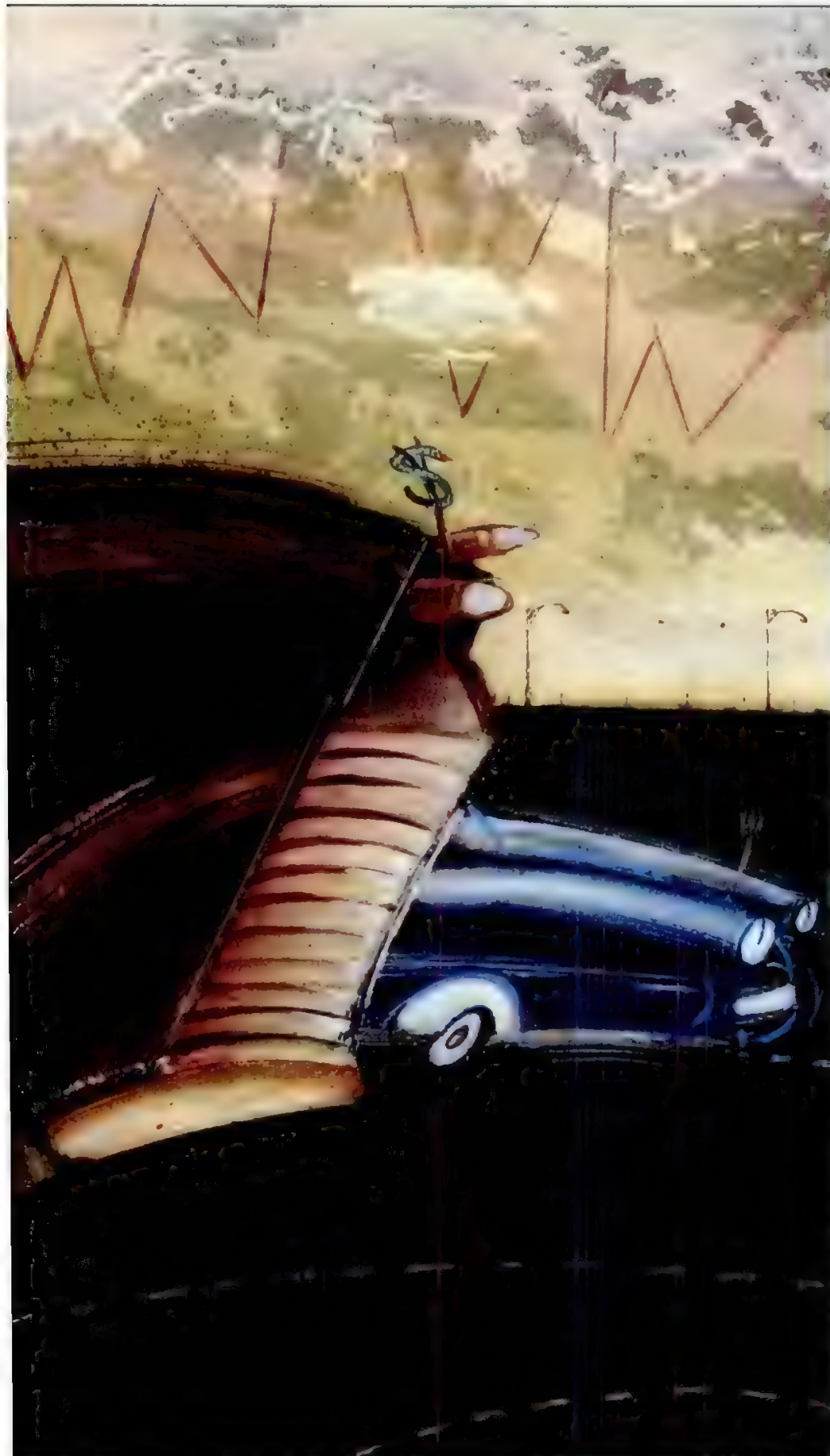
CIRCLE 734 ON READER SERVICE CARD

finied to investment houses with minicomputers or more.

Now, however, the increasing power of PCs makes it possible for individual investors to analyze market trends much as Wall Street big shots do. Two software systems in particular—*Technical Investor* from Savant Software and *Winning On Wall Street* from Summa Software—can give you the same look beneath the bubbling surface of business activity that banks and brokers get.

If you are an individual investor who wants to keep track of fairly substantial investments, the first question you might ask about a package before even considering price or ease of use, is, "What can it show me that I need to know?" This is the first aspect of these packages we will be looking at.





TECHNICAL SOFTWARE

The Technical Investor

The Technical Investor is a dream to operate. Its setup batch file and installation program automatically take care of the preliminary housekeeping chores and minimize the headache of configuring the program to your computer. *The Technical Investor* is a quality product.

The package's tutorial gives you a flavor of the program's capabilities and its power without overwhelming you with too many details. The tutorial is clearly written and includes an excellent reference section if you need more information on a given charting or analysis technique.

My initial impressions of *The Technical Investor* were quite favorable. The manual is well written and keeps your time and interests in mind. It is typeset and printed on high-quality paper, includes a table of contents and an index, and is generally attractive to the eye. *The Technical Investor* comes with versions for both DOS 1.1 and DOS 2.0, but Savant recommends using 2.0. You also receive sample data so you can test the analysis and charting techniques without having to manually enter data or download data from an information utility.

Miniscreens

When you start *The Technical Investor* you are presented with a graphic display of the various menu choices (see Figure 1). This menu is actually the main menu for the entire Savant Investor Series, which

FOCUS FILE

Winning On Wall Street

Summa Software Corporation
P.O. Box 2046
Beaverton, OR 97075
(503) 644-3212

List Price: *Trader's Data Manager*, \$200, *Trader's Forecaster*, \$250, *Trader's Accountant*, \$350.

Requires: 192K memory, two disk drives, graphics printer, color/graphics card.

CIRCLE 735 ON READER SERVICE CARD

The Volkswagen Alternative

DSF Software's Stock Trader is a low-priced technical investment program for those investors who don't require a lot of fancy features.

The *New York Times* says *The Technical Investor* is the "Cadillac of the technical investment software world." If so, then *Winning On Wall Street* would be a Mercedes.

You may not be looking for luxury, however, and may find a Volkswagen—and Volkswagen pricing—more attractive. If you are price-conscious, your charting needs are minimal, and you don't need to use all those fancy technical analysis techniques to help you decide when to buy and sell, then DSF Software's *The Stock Trader*, at \$79.95, may be for you.

This program, despite its low price, is not just another toy. It is a serious investment analysis tool that can help you with your stock trading decisions just as *Winning On Wall Street* and *The Technical Investor* do. Of course, it cannot come close to providing all the analysis tools that the more costly programs do, but it does have the basics down.

It displays charts to your screen or printer and computes moving averages. And DSF Software provides telephone technical support. If you have a modem, the company will supplement the stock data provided on the program disk by

downloading an initial amount of data free of charge.

If you have been considering using your computer to assist you with stock market decision making, this is an excellent package to consider. DSF Software also sells a demonstration disk for \$6.95 that lets you use the full capabilities of *The Stock Trader* for 15 trading days and includes 30 days of data for eight stocks and the Dow Jones Industrial Average.

The program comes with no documentation. It has a four-page cardboard instruction booklet that also serves as a protection cover for the program disk. The two inside pages contain instructions on how to get started with *The Stock Trader*. The large majority of the information about using the program is in on-line help messages that you access with the F1 key.

The information you get this way leaves a bit to be desired. Figure A shows the information that comes to the screen when you request help interpreting the chart shown in Figure B. I hope you get a bit more information if you call



The Stock Trader

DSF Software
P.O. Box 19624
Portland, OR 97219
(503) 244-4800
List Price: \$79.95

Requires: 64K RAM, one disk drive, color monitor, and dot matrix printer capable of producing boldface and italics.

CIRCLE 736 ON READER SERVICE CARD



DSF's support line. (The same screen is more helpful on a color monitor, however, than on the black-and-white printout in Figure A.)

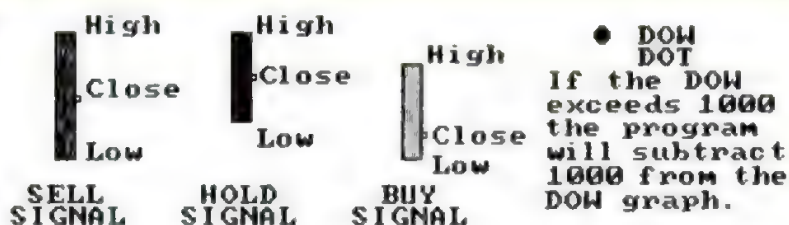
Graphs

The buy/sell/hold signals generated by *The Stock Trader* are based on three technical indicators. When you first start the program you supply parameters that affect these three indicators and hence affect the buy/sell/hold signals. You must develop your market knowledge through experimentation before deciding what parameter values to use for a particular stock you are trading. Advice concerning general ground rules on how to select these input parameters is available by telephone.

The Stock Trader produces a rather interesting report for each stock or index in the database. The report contains information about the technical indicators you are generating under various input parameters. It also makes excellent use of the printer by using boldface, italics, and regular print to highlight certain changes in a stock's prices. Figure C shows a sample of this report for AT&T stock.

To collect data for trading the stocks you are interested in, you must get the data from the daily newspaper and input it manually.

This program doesn't approach the sophistication of *Winning On Wall Street* and *The Technical Investor*, but it should be interesting to see what *The Stock Trader* has to offer. And for \$6.95 for the demo disk, you really don't have much to lose. —G.H.



The Dow Dot will also carry the Buy, Sell and Hold signals on the DOW averages.

The two wavy lines across the chart are magenta, for the short term average, and white, for the long term average.

The magenta boxes at the bottom of the graph are the relative sales volumes.

When the stock switches from buy to hold, it may be wise to place a stop sell with your broker.

HIT F2 TO RESUME PROGRAM

Figure A: Help message from *The Stock Trader* explaining buy/sell/hold information produced on the graph in Figure B.

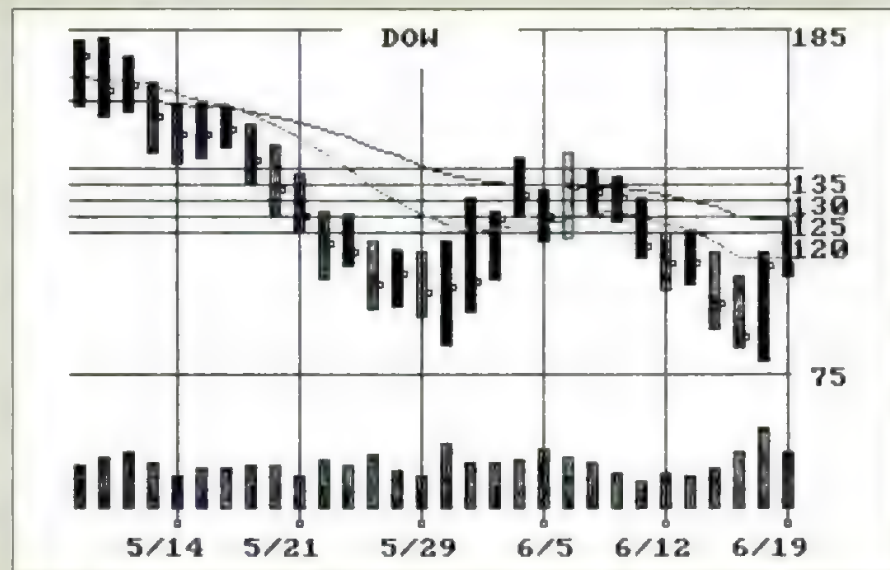


Figure B: Epson MX-80 printout of a *Stock Trader* graph. The actual graph is designed to be displayed on a color monitor, which depicts the buy/sell/hold signals in color.

(Sidebar continues)

The best values always come from a name you can trust.

SOFTWARE

Alpha Software
Alpha Base V..... \$329
ESP..... 529

Advanced Analytics Technology
the "Banner"..... \$ 22

Ashton-Tate
IBM/PC Reference Encyclopedia..... Call

ATI
All Training Prog's. ea \$ 49

B&L Multi-job (runs 9 prog's at once)..... \$145

Cdex
All Training Prog's. ea \$ 49

Central Point
Copy II PC..... \$ 34

dBASE II CORNER

Anderson-Bell
Abstat..... \$289

Ashton-Tate
d-Base II..... Call
d-Base III..... Call
Framework..... Call
Friday..... Call

Better Business Solutions, Inc.
dBase II
Writes Checks..... \$ 75

Data Based Solutions
dNAMES..... \$ 95

Fox & Geller
dGraph..... \$175
Quick Code..... 175
dUtil..... 58

Global Technologies
dbLINK..... \$ 69

Human Soft
dBase Plus..... \$ 85

Sensible Designs
dProgrammer..... \$199

Software Banc
Advanced d-base II
User's Guide..... \$ 27
Report Writing
w/ purchase of
dBase II..... \$ 10

Software Research Technologies
dFastest..... \$ 75
(All above available on PC-DOS.)

CompuView
Vedit CP/M 86..... \$160
Vedit..... 130
Systran..... 99

Continental/Arrays, Inc.
Home Accountant..... \$ 95
Small Business Acct..... 155
PC Combo Pak (Tax Advntg/Home Acct'l)..... \$169
Ultrafile..... 149

Decision Resources
Chart-Master..... \$255

Digital Research
Concurrent CP/M 86.. Call
CP/M-86..... Call
Pascal MT+86 CP/M.. Call
Pascal MT+ (PC DOS) Call
C Basic 86..... Call
C Language/compiler. Call
DR Graph..... Call
DR Logo..... Call
Personal Basic 86..... Call
PL/1-86..... Call
Others..... Call

Dow Jones
Market Analyzer..... \$229
Market Manager..... 189
Spreadsheet Link..... 179
Investment Evaluator.. 95

Ecosoft, Inc.
Microstat..... \$259

Emerging Technology
Edix (editor)..... \$139
Wordix (formatter)..... 139
Both..... 269

Enertronics
Energraphics..... \$259
w/ Plotter Option..... 299

Fastware
Thor (the thought organizer)..... \$245

Financier, Inc.
Financier II..... \$119
Tax Series..... 105

Fox & Geller
Grafox..... \$189
R-Graph (for R-base 4000)..... \$215

Harvard Associates
PC Logo..... \$129

Harvard Software
Project Manager..... \$249

Hayes
Smartcom II..... \$ 95
Please..... Call

Heritage
Smartkey II..... \$ 65

HyperGraphics Corp.
Authoring Graphics... \$299
Presentation Graphics 279
Object Libraries:
Computer Aids..... \$ 49
Maps..... 49
Borders..... 49

LOTUS 1-2-3 CORNER

Programs for your LOTUS 1-2-3

Consumer Software, Inc.
"Auditor" (proofing tool)..... \$ 85

Lighthouse Software
Key II (Data Mgmt for 1-2-3)..... \$149

National Training Systems, Inc.
Putting 1-2-3 To Work (8 application templates on diskette).. Call

Phoenix Consulting Group
3Plus (Fin. Planning, Forecasting)..... Call

Softsell
Templates, diskettes Call

Strategic Software Systems, Inc.
Bottomline V..... \$195

Whiterock Alternative
The Organizer (quickly access files thru branching tree syst)..... \$ 79

Trillium Computer
Visual Plus..... \$ 79
w/ All Shells..... 119

Individual Software
Prof. DOS..... \$ 47
Prof. Pixel..... 47

Innovative Software
T.I.M. IV..... \$275
Fast Graphs..... 229

Living Videotext
Think Tank (256K)..... \$139

MD&S, Inc.
Knowledge Man..... \$299

Micro Pro
Wordstar..... \$250
Starburst..... 109
Pak (WS, MM, SI, CS).... 359

Micram
Report Writer..... \$119
R:Base..... 279
R:Base Clout..... 129

Microsoft
MuMath/MuSimp..... \$179
Pascal Comp (DOS).... 229

Microsoft (cont'd)
Project Mgmt..... 199
C Compiler (DOS)..... 309
Basic Compiler (DOS) 249
Multiplan MS/DOS.... 129
Word..... 229
Word w/ Mouse..... 299
Others..... Call

Microstat
Crosstalk..... \$109

Morgan Computing
Professional Basic..... \$299
Trace 86..... 99

Mosaic Software
Super Chartman II..... \$299
Chartman IV..... 199
Both II and IV..... 350
Integrated 6..... 369

Multimate Systems Inc.
Multimate (WP)..... 269

North American Answer
(Database Prog.)..... \$159
Memory Shift..... 79

Northwest Analytical
Statpak..... \$365

Oasis
The Word Plus..... \$110
Punctuation & Style... 99

Open Systems
Acct'g Programs..... \$429
Buy 3 or more @..... 419

Opt-Tech
Data Processing
Sort (a file containing 4000 records of 128 bytes each can be sorted to produce an address file in 30 seconds)..... \$ 79

PC Innovations
PC RESET (push-button operated direct system reset)..... \$ 42
Remote Control Assembly..... \$ 29

PC Software
PC Crayon..... \$ 36

Peachtree Software
Back to Basics
Acct'g System..... \$219
Home Software Library..... Call

PeachPak 4
(GL, AP, AR)..... \$249
Series 8, ea. mod..... 389

Peter Norton
Utilities..... \$ 55

PowerBase Systems, Inc.
Power-base w/ DATAZOOM..... \$325

Prentice Hall
VCN Execuision..... \$299

PCjr.
Please call us regarding products for the IBM PCjr.

Redding Group
Graph Talk..... \$339
Synch (2780/3780)..... 379

SPI Open Access..... \$379

Satellite Software
Word Perfect w/ Sp... \$255
Others..... Call

Softcorp, Inc. PRO-JECT 6 (Complete Critical Path Mgmt Syst.)..... Call

Softcraft
Fancy Fonts..... \$125

Software Arts
TK! Solver..... \$265

Software Publishing
PFS: Report/Access.... \$ 79
PFS: File, Graph, Write 89
PFS: Plan..... 99

Sordim..... Call

Star Software
Legal Timekeeping, Billing & Accts..... \$695
Accounting Partner.... 269

Supersoft
Fortran IV PC/DOS or 8086..... \$279
8087 Support..... 40
Others..... Call

Wang/Aspen
Grammatik..... \$ 60
Proofreader..... 42

Warner Software
Desk Organizer (clears desk of 7 bus tasks) .. \$219

Woolf Software Systems
Move It (PC to CP/M and PC to PC)..... \$ 79
...and many more!

GAMES

Automated Simulation, Armonk, Avalon Hill, Blue Chip, Broderbund, Data Most, Infocom, Spinnaker Software, Sierra/On-Line, Sublogic, Weekly Reader, Xerox..... Call

BOARDS

DISPLAY CARDS

Amdelk
MAI Card.....\$420

Fredericks/Plantronics Colorplus...\$399

Hercules
Graphics Board\$339

MA Systems
Peacock
Clr Board.....\$249

Paradise/USI
Display Card
(clr/monochrome)...\$379

Quadram
Quadcolor I.....\$199
Quadcolor II.....389

Tecmar
Graphic Master\$479

AST Research

Six Pak Plus 64K (S&P,
Clk, exp to 384K).....\$279

MegaPlus 64K, (Cl/Cal,
S Port, 512K cap
w/ Megapak).....\$279

Extra ports for Mega-
plus and I/O Plus II
(Game, P/S).....\$ 40

Megapak 256K exp... Call

I/O Plus II
(Cl/Cal, S Port).....\$159

Maynard Electronics
Floppy Drive Cntrlr....\$169

w/ Par Port.....219

w/ Ser Port.....229

Sandstar.....Call

Orange Micro
Mr. Chips.....Call

PC NETWORKING

AST Research
PC 002 NET
Starter Kit.....\$899

Orchid Technologies
The "Orchid Blossom"
(to 384K, Clk, w/ alarm,
S&P ports, ram disk &
disk caching, upgrade-
able to PCNet).....Call

Quadram.....Call

Santa Clara
Starter Kit.....\$1245

X-Comp X Net
(2 bds, 2 users).....\$829

X Net exp bd..eo 429

Add'l Networking
Products.....Call

Quadram

Quadboard 64K, (exp
384K, Clk/Cal, S&P
Ports, Software).....\$269

Quadboard 384 (OK) . 239

Microfazer Stack Printer
-P/P 8K.....\$139

-S/P 8K (exp 64K only) 149

-S/S 8K (exp 64K only) 149

Quadlink 64K Memory
allows Apple SW to
run on IBM/PC).....\$469

All Other ProductsCall

Xedex/Microlog
Baby Blue II.....Call

Purchase a SINGLE
Board and SAVE SPACE
for future expansion!
by

INNOVATION/ Bronson Electronics Corporation

"Innovation CGP"

- Full color graphics capability.
 - Single or double-dot character fonts
 - Parallel printer port.
 - Fully compatible with IBM PC/XT, Portable and look-alikes.
 - Compatible with all IBM hardware.
 - Compatible with all color graphics software for IBM PC, XT, Portable (including Lotus 1-2-3).
 - One year warranty.
- ORYX Price Call

MONITORS

Amdelk
300A Amber\$149

Color II +.....429

NEC
JB1201-12" Green.....\$169

JB1260-12" Green.....119

JC1216 RGB.....429

PGS
HX12 RGB Color.....\$489

MAX 12.....189

SR12 (690x480 Res)... 639

Doublr Cd (SR12).....175

Quadram
Quadchrome\$489

Sanyo
8112 12" HR Green....\$195

Taxon

KG12N-UY 12" Am....\$129

KG12N 12" Gr.....132

RGB Vision-1 12" Clr.. 319

RGB Vision-3 12" Clr.. 449

USI 1200A
12" HR Am.....\$139

MODEMS

Hayes
Smartmodem 300.....\$205

Smartmodem 1200Call

Smartmodem 1200B... Call

Microcom, Inc.
Era 42 (1200 int baud) \$395

NovationCall

Quadram Quad-
modem (Stand alone,
full 212A, compatible
w/ Quadlink SW).....\$529

US Robotics
Auto-Dial 300/1200 ...\$459

S-100 Modem.....349

Ventel
300-1200 baud Modem
w/ Crosstalk for
portables.....\$459

DISK DRIVES

CDC 1800\$209

Corvus HDCall

Datamac
Truster 10H.....Call

Davong HD.....Call

I-Omega
Bernoulli Box
(10 MB removable)... Call

Santa Clara HD.....Call

Tandon TM-100-2.....\$199

Vista
Dynaframe Systems
w/ 5-40 MB Primary
Disk Drive.....Call

PRINTERS

Dana/Abati
LQ-20P.....\$429

Diablo
630 ECS.....Call

630 API.....Call

Mannesman Tally
MT180L.....\$799

MT160L.....569

Spirit.....299

420L.....Call

440L.....\$2399

NEC 3550.....\$1625

Okidata 82-93.....Call

Quadram Quadjet... Call

Siemens Ink Jet
Printers PT88.....Call

Star Micronics.....Call

Teletex T1014.....\$499

...and much more.

SPECIAL OF THE MONTH!

Juki Industries of America, Inc.

6100 - Prints graphics
2K buffer, (exp to 8K),
tractor feed option,
bidir, prop spacing,
11" print line, uses
100-char drop-in
daisywheel and IBM
Selectric II® ribbon..\$449

Profit Systems, Inc.
Tascmaster (performs
up to nine tasks
at once).....Call

FREE with purchase of
Tascmaster - Addram
64K board - choose
either Elite or Plus!
FREE!

DISKETTES

3M 5" DS, DD Box...\$ 40

CDC\$ 28

Maxell 5" DS,
DD MD2 Box.....\$ 40

Spectrum 5 1/4"
DS, DD (Box/10).....\$ 29

Verbatim
5" DS, DD, Box\$ 35

(3 Boxes Diskettes Min.)

PLOTTERS

Amdelk
DXY-100.....\$599

Amplot II.....899

Enter
P100 Sweet P.....\$545

Sweet P Six Shooter... Call

Houston Instruments Call

Panasonic
Digital Plotter
VP6801P.....\$1375

MISC.

Alpha-Delta "MACC"
Surge Protector.....\$ 69

American Tourister
Protective cases for
computers, printers... Call

Computer Accessories
Power Director (surge/
transient protection,
EMI/RFI filtration,
integrated power
cntrl).....Call

Flip 'n' File 5 1/4".....\$ 22

Hauptpage
87 Chip.....\$159

Other Products.....Call

Key Tronic
S150.....Call

KB5151.....Call

KB5151 Dvorak.....Call

Microsoft Mouse.....\$155

Mouse Systems
PC Mouse.....\$159

PMC Industries, Inc.
Surge/Power
Protectors.....Call

RH Electronics, Inc.
Guardian Angel (200
watt uninterruptable
power source).....Call

Power Angel (800w)... Call

Titan Technologies, Inc.
PC Accelerator (plugs
in, programs run 2 1/2
to 4 times faster).....Call

SGL Homalite
Optech CRT filters.... Call

Street Electronics
Echo speech synth
for IBM.....\$179

Systems Mgmt. Assoc.
PC Documate (com-
prehensive ref aids).. Call

TG Joystick.....\$ 49

Thunderware
Thunderclock.....\$126

Valley Craft
Computer Furniture
& Data Stations.....Call

Versa Computing
VersaWriter.....\$239

A variety of complete
PC compatible systems
are available at Oryx.
For assistance in
determining your needs,
use our technical line.
We will be happy to
provide full support.

POLICY:

- Wisconsin residents add 5% for sales tax.
- Minimum \$4.00 for shipping, handling and insurance for orders to \$200.
- For orders over \$200, add 2 1/2% for shipping, handling and insurance.
- For cash prepayment of orders \$200 or more, add ONLY 2% for shipping, handling and insurance.
- Foreign — either add 15% handling & shipping (Int'l money order) or inquire.
- Prices are subject to change without notice.
- All items subject to availability

WE WELCOME:

- Visa, MasterCard and American Express. (No charge for credit cards.)
- Corporate, government or educational volume purchases, please ask for special accounts desk for additional discount. (1-715-848-1374)
- COD (Add \$2.00 per box/parcel. Cash or certified check required.)
- Checks. (Allow 1-2 weeks for clearing.)

WORKING HOURS:

Monday-Friday 8:30-6:00 • Saturday 10:00-2:00 • Central Time
Circle #363 for Special of the Month
CIRCLE 351 ON READER SERVICE CARD

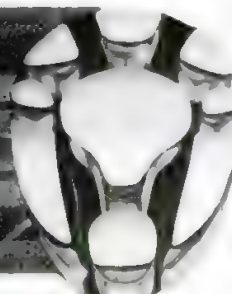
ORYX SYSTEMS, INC.
CRAFTSMEN OF THE NEW TECHNOLOGY

1 800 826-1589

WITHIN WISCONSIN **1 800 472-3535**

425 First Street • P.O. Box 1961
Wausau, Wisconsin 54401

*For tech. support & order status: 715-848-1374



TECHNICAL SOFTWARE

(The Volkswagen Alternative continued)

AT&T

Current Price: 16.75 Long Term Average: 15.75 Short Term Average: 15.88

DATE	HIGH	LOW	CLOSE	VOLUME	SHORT AVERAGE	LONG AVERAGE	DIFF.
5/8/84	16.50	16.25	16.50	9871	16.01	15.90	0.11
5/9/84	16.63	16.38	16.50	8888	<i>15.97</i>	15.94	0.03
5/10/84	16.50	15.50	<i>15.88</i>	2210	<i>15.96</i>	15.94	0.02
5/11/84	16.00	15.13	15.88	12130	<i>15.93</i>	15.94	-0.01
5/14/84	15.88	15.63	<i>15.75</i>	10284	<i>15.90</i>	<i>15.93</i>	-0.03
5/15/84	15.88	15.63	15.88	10732	<i>15.88</i>	15.93	-0.05
5/16/84	16.00	15.75	15.88	10833	15.88	15.93	-0.05
5/17/84	15.88	15.63	<i>15.75</i>	7851	15.88	<i>15.92</i>	-0.04
5/18/84	15.88	15.63	15.75	9049	<i>15.84</i>	<i>15.91</i>	-0.07
5/21/84	16.00	15.75	15.88	9931	<i>15.83</i>	15.91	-0.08
5/22/84	15.88	15.63	<i>15.63</i>	8476	<i>15.82</i>	<i>15.89</i>	-0.07
5/23/84	15.88	15.63	15.75	9419	<i>15.77</i>	<i>15.88</i>	-0.11
5/24/84	15.75	15.50	<i>15.50</i>	13029	<i>15.73</i>	<i>15.85</i>	-0.12
5/25/84	15.75	15.50	15.63	10355	<i>15.71</i>	<i>15.84</i>	-0.13
5/29/84	15.63	15.38	<i>15.38</i>	7856	<i>15.66</i>	<i>15.81</i>	-0.15
5/30/84	15.50	15.25	15.50	10799	<i>15.64</i>	<i>15.79</i>	-0.15
5/31/84	15.63	15.38	<i>15.38</i>	9047	<i>15.60</i>	<i>15.76</i>	-0.16
6/1/84	15.50	15.38	15.50	8388	<i>15.58</i>	<i>15.74</i>	-0.16
6/4/84	15.50	15.25	<i>15.38</i>	10188	<i>15.55</i>	<i>15.72</i>	-0.17
6/5/84	15.50	15.13	<i>15.25</i>	12009	<i>15.50</i>	<i>15.69</i>	-0.19
6/6/84	15.50	15.00	<i>15.13</i>	14102	<i>15.44</i>	<i>15.65</i>	-0.21
6/7/84	15.25	15.00	15.13	17827	<i>15.39</i>	<i>15.62</i>	-0.23
6/8/84	15.25	15.00	15.13	10243	<i>15.35</i>	<i>15.59</i>	-0.24
6/11/84	15.25	15.00	15.25	7975	<i>15.33</i>	<i>15.57</i>	-0.24
6/12/84	15.83	15.13	15.75	15706	15.39	15.58	-0.19
6/13/84	15.88	15.50	<i>15.63</i>	12275	15.43	15.58	-0.15
6/14/84	15.63	15.38	<i>15.50</i>	9308	15.44	<i>15.57</i>	-0.13
6/15/84	16.13	15.50	16.13	17456	15.55	15.61	-0.06
6/18/84	16.63	15.88	16.63	22749	15.72	15.68	0.04
6/19/84	16.75	16.38	16.75	29610	15.88	15.75	0.13

The columns depicting the close, short average, and long average are set up to reflect value changes.

Boldface : Value increase (**BOLDFACE**)
 Italics : Value decrease (*ITALICS*)
 Straight Type : No changes (**STRAIGHT**)

Copyright 1984, DSF Associates

(Sidebar ends)

Figure C: Report produced by The Stock Trader showing volume and value of the technical indicators used by the program to generate buy/sell/hold signals.

will eventually include modules for fundamental analysis and portfolio management.

You can now access *The Technical Investor's* main programs, and that of the communications module included with the package, by using the PC's cursor keys. Paul Langston, manager of marketing for Savant, says the fundamental analysis module will be available by late fall of 1984 and the portfolio module by the first quarter of 1985.

The Technical Investor's communications software supports the Dow Jones News/Retrieval service and the Warner Computer System service. It will download stock price and volume information by stock symbol onto a data disk. Once you have the information you need, you can enter the charting program. You are then presented with two horizontally split screens (called miniscreens by Savant) and are prompted at the bottom of the screen to enter a stock ticker symbol. When you enter a stock symbol from the data disk, you are shown a high/low/close price chart in the top miniscreen and a volume chart for the selected stock in the lower miniscreen (see Figure 2).

One unique feature of *The Technical Investor* is its ability to split the screen into

The Technical Investor can split the screen into four miniscreens.

up to four miniscreens at any time during a charting and analysis session. Since the program is command-driven, you create new charts by issuing commands through a "command line" at the bottom of the screen rather than by selecting items from a menu. At any point, you can issue an NS (for Number of Screens) followed by the number of miniscreens you would like to use. Figure 3 shows a screen divided into

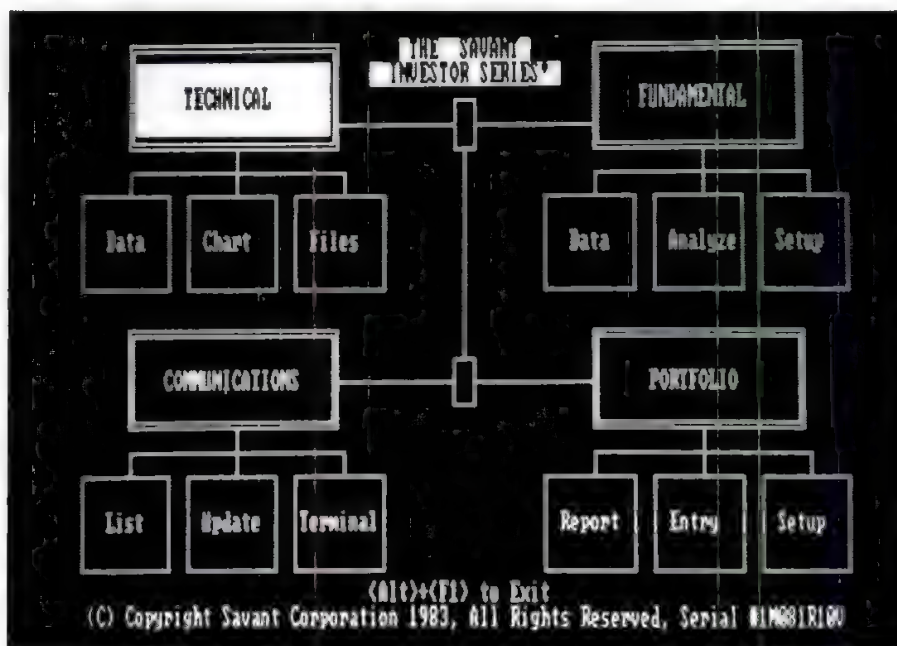


Figure 1: Main menu screen for *The Technical Investor* by Savant Software.

four miniscreens. You can move charts from one screen to the other or change the number of screens displayed at any time.

Automatic User Procedures

Like other sophisticated packages, *The Technical Investor* supports "command files" that contain multiple command sequences. *The Technical Investor* calls this command file feature "automatic user procedures." To create a user procedure, you issue the DP command, followed by the letter of the alphabet and the sequence of commands you want to execute when you call the procedure.

For example, suppose you had Figure 2 on the screen and you wanted to define a procedure to set the number of miniscreens to four, select miniscreen 3 (SS), clear it (CS), and plot (on miniscreen 3) a high/low/close price bar chart (PB), a 12-day exponential average (EA) of the closing-price time series, and a 50-day exponential average of closing price. Then you planned to select miniscreen 4, clear it, and plot a volume bar chart (VB) and a negative volume indicator (NV) on miniscreen 4.

You would define the automatic user procedure (which we shall call user procedure A) that accomplishes all of these tasks with the following command:

```
DP;A;NS;4;SS;3;CS;PB;EA;
12;EA;50;SS;4;CS;VB;NV
```

You then invoke the procedure using only four keystrokes: XP;A (execute procedure A). Figure 3 shows the results of using this procedure on the screen that is shown in Figure 2.

As you look at Figure 3 and the commands used to create it, you can begin to see how powerful *The Technical Investor's* analysis and charting capabilities are. It is also easy to use. All the commands are defined on a reference card; the manual's reference section describes each command and how it is issued and discusses its results. You can quickly learn how to make effective use of the commands and combinations of commands you want to implement.

You define up to 38 user procedures at any one time, 26 from the letters of the alphabet, 10 from the function keys, and two special procedures—"startup" and "autoplot." The startup procedure is auto-

In Software we're the *logical* choice!

**LOWEST
PRICE
GUARANTEE**

**WE'LL BEAT ANY PRICE
BY \$10 AND THANK YOU
FOR THE PRIVILEGE**

**FREE* OVERNIGHT
DELIVERY**

*YOU PAY ONLY THE UPS GROUND CHARGES.
LOGICSOFT PAYS THE "OVERNIGHT" AIR CHARGES

**TOLL-FREE
SUPPORT**

LOGICSOFT OFFERS TOLL-FREE, UNLIMITED
TECHNICAL SUPPORT FOR ALL OUR CLIENTS

1-800-645-3491
516-741-0043 (N.Y.S.)

LOGICSOFT

A MEMBER OF THE LOGIC GROUP

LOGICSOFT is a Reg. T.M. of Logisoft, Inc.



Continental U.S.

1-800-645-3491

300 Garden City Plaza,
Garden City, New York 11530

New York State 516-741-0043
Canada 416-283-2354
Int'l. Telex ... 230199 Swift UR LGS
Dom. Telex . 960127 Swift NYK LGS



NO SURCHARGE FOR CREDIT CARDS
Purchase orders accepted by qualified institutions

Add 2% for shipping and handling ☐ COD ☐ Check ☐ Money Order ☐ NYS residents add sales tax
CIRCLE 282 ON READER SERVICE CARD



TEAR and COMPARE

Use this card to Shop the magazines

SEE REVERSE SIDE FOR ACCOUNTING SYSTEMS

LOGICSOFT

LOWEST PRICE GUARANTEE

WE'LL BEAT
ANY PRICE
BY \$**10** AND
THANK YOU
FOR THE
PRIVILEGE

Tell us the advertiser and price for any IBM-PC software package advertised in a current issue of any popular computer publication and we'll beat that price by \$10. This offer does not apply to those packages whose advertised price is under \$100 or where LOGICSOFT's price is already the lowest!

ALL IN ORIGINAL FACTORY SEALED BOXES

WE
OFFER
OVER
400
OTHER
TITLES

LANGUAGES/UTILITIES

Concurrent CP/M86 (Digital Research)	\$225
Pascal MT+ (Digital Research)	\$235
PL/1 (Digital Research)	\$479
Display Manager (Digital Research)	\$359
Lattice C Compiler (Lifeboat)	\$299
CIS Cobol 86 (Digital Research)	\$479
Pascal Compiler (Microsoft)	\$245
C Compiler (Microsoft)	\$325
Basic Compiler (Microsoft)	\$245
Cobol Compiler (Microsoft)	\$459
Business Basic (Microsoft)	\$369
Fortran Compiler (Microsoft)	\$245
Prokey 3.0	\$89
Norton Utilities	\$59
Sideways	\$45

WORD PROCESSING

Wordstar	\$235
Wordstar Pro Pak	\$365
Wordperfect	\$295
Volkswriter Deluxe	\$175
MULTIMATE	\$275
Microsoft Word with Mouse	\$289
Peachtext 5000	\$195
Easywriter II Speller/Mailer	\$425
Samna Word III	\$159
Think Tank	\$85
pfs:write	\$239
Xywrite II Plus	

INTEGRATED/GRAPHICS

Framework	\$375
Open Access	\$379
Jack 2	\$309
Lotus Symphony	\$435
LOTUS 1-2-3	\$309
Dayflo	\$369
Supercalc	\$229
Multiplan	\$135
TKISolver	\$269
BPS Graphics	\$289
Chartman II & IV	\$349
Chartmaster	\$279

DATA BASE/FINANCIAL

R:Base 4000 (Microrim)	\$309
Knowledgeman	\$275
pfs:file	\$85
Powerbase	CALL
dBASE III	\$375
TIM IV	\$269
Friday	\$169
Data Base Manager II (Alpha)	\$195
Revelation	CALL
Managing Your Money (Tobias)	\$159
Financier II	\$115
Harvard Project Manager	\$285

CLIP AND SAVE OUR CARD FOR YOUR FILE



NO SURCHARGE FOR CREDIT CARDS

Purchase orders accepted by qualified institutions.

Add 2% for shipping and handling • COD • Check • Money Order
• NY residents add sales tax

1-800-645-3491

New York State 516-741-0043 Int'l Telex ... 230199 Swift UR LGS
Canada 416-283-2354 Dom. Telex . 960127 Swift NYK LGS

LOGICSOFT

A MEMBER OF THE LOGIC GROUP

300 Garden City Plaza, Garden City, NY 11530

Continental U.S.

1-800-645-3491

New York State

Canada

Int'l Telex

Dom Telex

516-741 0043

416 283 2354

230199 Swift UR LGS

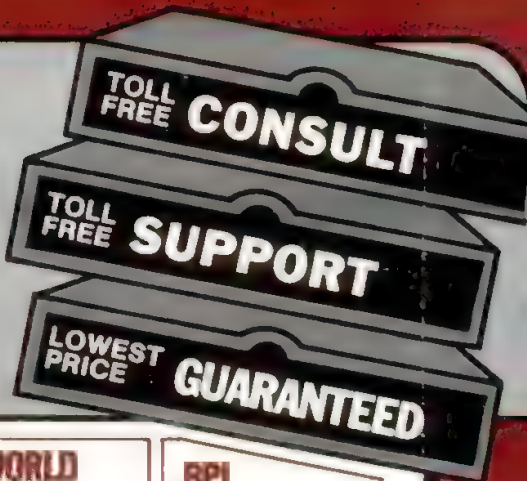
960127 Swift NYK LGS

Looking for an Accounting System?

CALL US...

WE'VE EVALUATED OVER 50 OF THEM

See our ad in *Journal of Accountancy*



**INFORMATION
UNLIMITED
SOFTWARE (IUS)**
\$295 Per Module
general ledger
accounts payable
accounts receivable
inventory
order entry

payroll \$359
financial series
(G/L, A/P, A/R) ... \$859

CHAMPION
\$399 Per Module
general ledger
accounts payable
accounts receivable
payroll
inventory control

**PEACHTREE
SERIES 8**
\$375 Per Module
general ledger
accounts payable
accounts receivable
payroll
inventory
sales invoicing
job costing

OPEN SYSTEMS
\$559 Per Module
general ledger
accounts payable
accounts receivable
payroll
inventory
sales order processing
purchase order processing
job costing

**REALWORLD
(MBSI)**
\$575 Per Module
general ledger
accounts payable
accounts receivable
payroll
order entry/inventory
sales analysis \$289

STATE OF THE ART
\$479 Per Module
general ledger
accounts payable
accounts receivable
payroll
inventory
sales invoicing
time keeping & billing \$679

BPI
\$395 Per Module
general ledger
accounts payable
accounts receivable
payroll
inventory
job costing

**GREAT PLAINS
SOFTWARE**
\$479 Per Module
general ledger
accounts payable
accounts receivable
payroll
inventory

TCS
\$1195
client write up

WE CARRY CONTINUOUS FORMS COMPATIBLE TO ALL THE ACCOUNTING SYSTEMS WE SELL



QUANTITY DISCOUNTS AVAILABLE

IMPROVE YOUR OFFICE PRODUCTIVITY
and ENHANCE YOUR COMPANY IMAGE WITH
QUALITY

CONTINUOUS BUSINESS STATIONERY
From your artwork or our stock designs

FREE
BOX OF
10
FLOPPY DISKETTES
(LOGICTRAK DD5 5 1/4" DDSD-SOFT SECTORED)
WITH INITIAL STATIONERY ORDER

LogicPert gives you the edge,
stationery that separates easily,
leaving clean sharp edges.



CALL FOR
A **FREE**
STATIONERY KIT
NO COST OR
OBLIGATION

LOGICSOFT
A MEMBER OF THE LOGIC GROUP

We're known by the companies we keep

- ASHTON - TATE
- DIGITAL RESEARCH
- DOW JONES
- INNOVATIVE SOFTWARE
- IUS
- FOX and GELLER
- LIFETREE
- LOTUS
- MICRORIM
- MICROSOFT
- PEACHTREE
- SATELLITE SOFTWARE
- SOFTWARE ARTS
- SOFTWORD SYSTEMS
- SORCIM
- AND OVER 100 OTHER PUBLISHERS

- the Logical Choice!

LOGICSOFT

A MEMBER OF THE LOGIC GROUP

LOGICSOFT is a Reg. T.M. of Logicsoft Inc.

NO SURCHARGE FOR CREDIT CARDS

Continental U.S.

1-800-645-3491

300 Garden City Plaza, Garden City, NY 11530



New York State 516-741-0043
Canada 416-283-2354
Int'l. Telex ... 230199 Swift UK LGS
Dom. Telex ... 960127 Swift NYK LGS

Instant Financial Picture With Your Analyst!



Specifically, a financial analyst.

Like the BottomlineV™ software package. Because unless you've got hundreds of hours for programming, you'll go nuts doing financial planning, analysis, modeling or five-year forecasting with spreadsheet software alone.

Your personal financial advisor.

BottomlineV takes the mystery out of financial analysis and planning. Working with your spreadsheet software, it gives you instant access to the same profitability measures and financial ratios that bankers use to test investment soundness.

You'll know in seconds important long-range information—the kind of facts and figures that give you credibility when you establish lines of credit, raise venture capital or obtain a loan.

No programming required.

BottomlineV makes forecasting and modeling easy because it does hundreds of complicated calculations for you. That's right, it does hundreds of calculations. If you make a change to any part of your model, it will ripple through the entire model. Automatically updating it.

For example, suppose you want to know how an increase in sales will affect your profit picture.

BottomlineV will tell you.

First, it will revise your income statement (P&L).

Then it will update your balance sheet and cash flow to see if your goal is achievable.

It will even give you 24 different ratio analyses that will help you better plan and run your business.

With BottomlineV, you don't have to know computer programming. You don't have to be an accountant. You hardly even have to know how to operate your spreadsheet software.

Yet you will be able to see your complete financial picture. Instantly.

BottomlineV works with IBM®, Apple®, Kaypro®, DEC® and most other MS-DOS and CP/M systems.

It sells for only \$295.00. For that kind of money, no other financial analyst can give you so much good advice.

Go to your nearest dealer and ask for a BottomlineV demo. (Also ask about our

other new packages:
BottomlineTAX™
BottomlineGRAF™
and d-Bottomline™)

Bottomline V

take over where spreadsheets leave off.

ILAR Systems, Inc., 1300 Dove Street, Suite 200, Newport Beach, CA 92660 (714) 476-2842

Lotus 1 2 3 MultiPlan SuperCalc Perfect Calc IBM Apple Kaypro and DEC are registered trademarks of respectively VisiCorp Lotus Development Corp Sorcim Corp Perfect Software Inc International Business Machines Corp Apple Computer Inc Kaypro Corp and Digital Equipment Corp

CIRCLE 224 ON READER SERVICE CARD

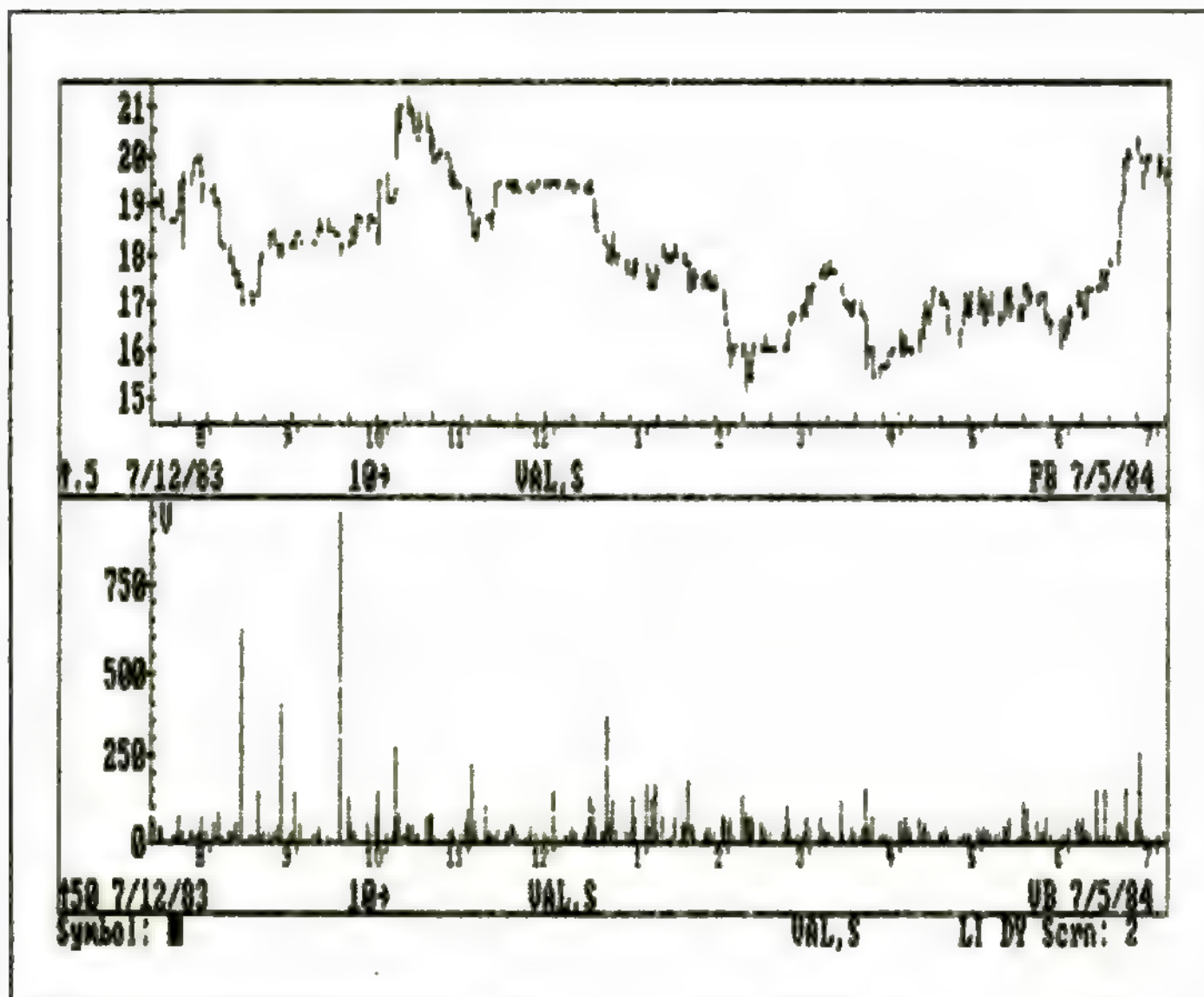


Figure 2: A high/low/close price chart and a volume chart for Valspar Corporation produced by Savant Software's Technical Investor.

automatically executed when you boot up *The Technical Investor*, and the autoplot procedure is automatically executed when you enter a stock symbol and press AN (autoplot on). Pressing AF (autoplot off) turns the feature off.

The autoplot procedure is set to plot a price bar in miniscreen 1 and a volume bar in miniscreen 2 as soon as you enter a symbol. To get another price and volume plot, you merely enter another symbol.

Analysis Capabilities

The Technical Investor is obviously written with the serious technical investor in mind. Some of the more sophisticated analysis routines built into *The Technical Investor* allow you to plot exponential averages (EA), linear regressions (LR), moving averages (MA), negative volume indicators (NV), on-balance volume indicators (OB), oscillator functions (OS), point and figure charts (PF), price volume trend indicators (PT), positive volume indicators (PV), relative strength charts

(RS), trading bands on exponential, moving, or weighted moving averages (TE/TM/TW), and weighted moving averages (WA); you can also draw speed resistance lines (RL).

The Technical Investor has all the power even the most technically competent investor could want and more.

Winning On Wall Street

Whether or not *Winning On Wall Street* will make you a success in the stock market, the package itself is a winner, in my opinion, one of the best technical analysis packages on the market today.

Winning On Wall Street offers you more analysis techniques than you could possibly make effective use of in a week. And if you discover a new technique it doesn't include, you can probably use *Winning On Wall Street's* "user-defined procedures" to implement it. (Summa might also be willing to add your latest analysis tool to the next version released.)

First Impressions

My first impressions of *Winning On Wall Street* were good. The documentation is well written, provides enough detail to allow you to get a good understanding of the package's technical analysis tools, and is typeset on high-quality paper. The program has a good user interface program to allow you to configure the software to your particular computer. The communications parameters are easily set from a configuration menu. It accepts your information utility's password and automatically configures your Hayes Smartmodem so that you can easily download data automatically from the Dow Jones News/Retrieval service or from Remote Computing Corporation's Dial/Data service.

Winning On Wall Street is actually three separate programs each of which is able to access the same data on a single data disk: *Trader's Data Manager*, *Trader's Forecaster*, and *Trader's Accountant*.

The *Data Manager* allows you to create and maintain a database of daily, weekly, or monthly statistics for any stock or security you select. It is designed as a standalone package to display graphs and tabular data about the securities in your personal *Winning On Wall Street* database. However, if you want to analyze the data you must have the *Trader's Forecaster* module.

The *Forecaster* includes the technical analysis tools used by analysts, brokers, and professional institutional investors. However, *Forecaster* cannot be operated without first purchasing the *Forecaster* module.

The third program, *Accountant*, is an add-on to *Data Manager's* securities trading records, storing market transactions and summarizing them. This requires

Trader's Data Manager

The *Data Manager* program will retrieve data automatically from Dow Jones or from Dial/Data. You can also enter it manually. It creates charts, prints reports, maintains the data in your database, configures the software to your computer system, and will list the files on the data disk.

Automatic Data Retrieval

The automatic data retrieval feature makes downloading data effortless and efficient. *Winning On Wall Street* will configure your modem properly for data downloading from the utility. All you do is instruct it to retrieve data automatically and sit back and watch the software, computer, and modem do the work for you.

I was particularly impressed with the Express Update option for automatically downloading data to your database. For instance, when you are retrieving daily data for all stocks in your database, this option will cause *Winning On Wall Street* to look at the last date entered for each stock and automatically add any data you are missing up through the current date. You can have, for example, three stocks with daily data through 12/31/83 and two stocks with data through 4/30/84. The Express Update feature will note how much data each stock has and add the daily data only for those days needed to bring each stock up to date.

This feature can save you a lot of headaches when you haven't updated your database for a while or you are adding new stocks to your portfolio. It will also save you some money in updating costs because it only retrieves just the data each stock needs rather than downloading, for instance, a year's worth of daily prices for each stock.

Charting

Winning On Wall Street's charts are crisp and professional-looking (see Figures 4, 5, 6, 7 and 8). As you can see from Figure 4 (the standard display when selecting a high/low/close versus a volume

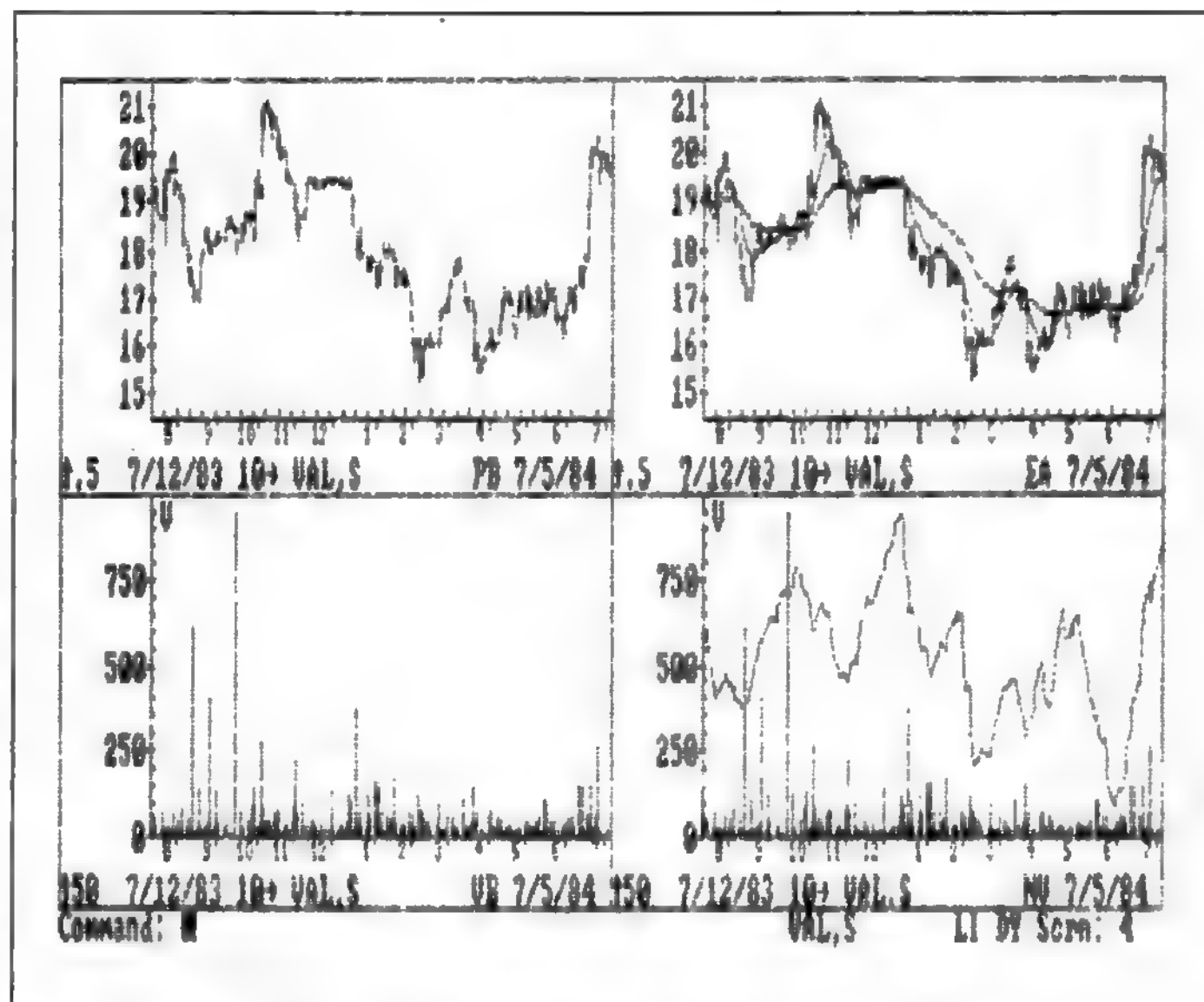


Figure 3: A four-way miniscreen display produced by The Technical Investor.

chart), *Winning On Wall Street* displays the price data at the top of the screen and the volume data at the bottom.

Since the *Data Manager* loads up to ten stocks for charting into memory at once, charting is also very fast. When you

Using Winning
On Wall Street's
update feature
can save you
a lot of headaches.

request a chart, the data is read from memory rather than from disk. A high/low/close price and a volume chart for 190 days of daily data is produced on the screen in less than 4 seconds. It takes about 75 seconds to load a year's worth of data for ten stocks from disk to memory. I find it worthwhile to spend a little time loading data from disk into memory for several stocks at a time in order to get fast-

er displays of the graphs when I call for them.

This feature does have its shortcomings, however. Since the point is to group stocks for comparison, you have to be careful to put stocks you want to compare in the same "group." Otherwise you will end up losing time swapping from one group of stocks to another.

When you select the Draw Charts option from the main menu, you can choose up to nine groups of stocks for charting. You might designate one group for each of several portfolios you are tracking or a new group of stocks you are currently considering. You might even group stocks by industry segment.

You can have up to ten stocks in each group, one for each of the PC's ten function keys. You select stocks within groups by pressing the function key that you have associated with the stock. You can quickly compare one chart with another in its group merely by pressing the function keys for each stock. Industry averages such as the Dow Jones Industrial Average

J A V I

**WE'RE
REWRITING
THE PC
RECORD BOOKS.**

JAVELIN

Breakthroughs in flexibility and performance let you upgrade your PC storage and optimize your total system.

Introducing Javelin, the first storage subsystem that lets you increase your IBM PC, PC XT, or PC AT capacity to exactly the level you require. No more, no less.

How does Javelin do it? By offering you the widest range of storage capacities available today. 5¼" Winchester disk drive from 36 to 110 MB and ¼" streaming tape backup of 60 MB. A choice of two peripherals—one disk and one tape, or two disks.

Whether you use Javelin as added storage to a stand-alone PC or as a high-capacity, high-performance file server in a network—you only pay for what you really need.

Keep your options open for the future. The SCSI* technology used in the Javelin offers easy future expansion. This technology also allows for backup and restore without CPU intervention—with special commands included in the controller.

Javelin's rigorous quality program. Javelin's reliability, like that of every Emulex product, is built in and guaranteed. All active components are pre-aged. Subassemblies are cycled environmentally—under power, performing diagnostic tests and the total system is integrally tested.

*The Small Computer System Interface (SCSI) is an interface standard that specifies the mechanical, electrical and functional requirements for a small computer I/O bus interface and command set for peripheral devices commonly used with small computers.

Javelin features a full range of utilities that allow for flexible expansion with minimal user intervention.

Call or write us for more information, or ask your dealer for a demonstration. Seeing Javelin in action is a breakthrough experience.

Javelin's unique features include:

- Easy to install and use
- 100% IBM compatible
- 30ms average access rate
- Compact, desk-top design to complement your IBM PC
- Network ready
- Designed for data intensive applications
- Reliable backup and restore utility
- Ideal data-base management storage/retrieval device
- Backup media interchangeability
- Advanced disk and tape diagnostics

Javelin is a product of Emulex Corporation, an industry leader in the development of high-performance controllers, communications products and packaged subsystems for PC's, micro, mini and super mini-computers.

EMULEX PERSYST
PERSYST
PERSYST

3545 Harbor Blvd., P.O. Box 6725, Costa Mesa, CA 92626, (714) 662-5600
CIRCLE 174 ON READER SERVICE CARD



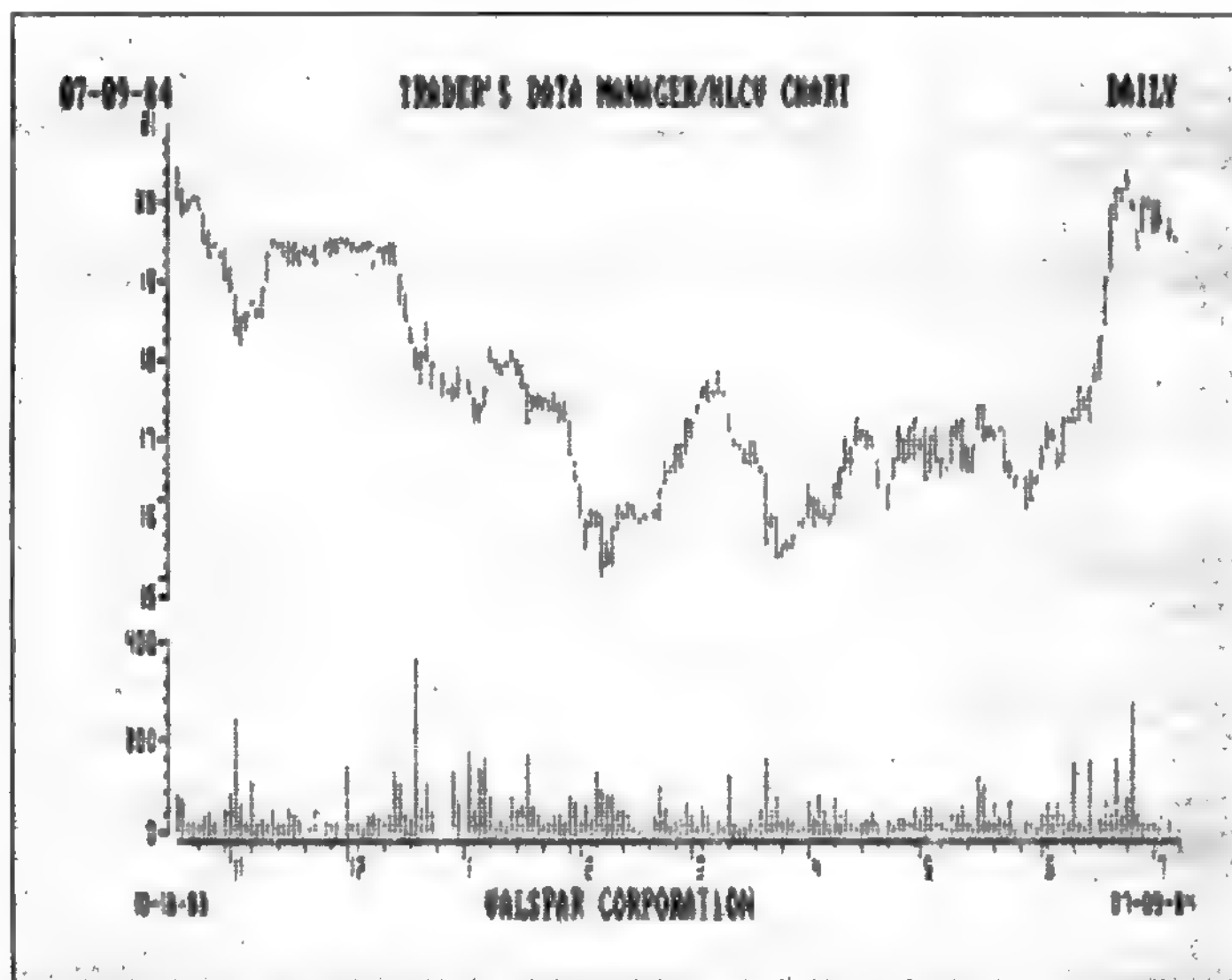


Figure 4: Winning On Wall Street's "standard" high/low/close/volume chart.

can also be assigned to a function key within a group.

You can compare an industry average with a stock by pressing the two function keys. You cannot, however, display high/low/close and volume charts for multiple stocks or industry averages on the same screen. You can compare multiple close prices for two stocks or for an industry average and a stock (see Figure 5).

Trader's Forecaster

The *Trader's Forecaster* program is a collection of sophisticated graphics and technical analysis tools. You use this portion of *Winning On Wall Street* to identify patterns by mathematically analyzing price and volume data for a stock or index.

This particular module includes five classic trending techniques: moving averages, weighted moving averages, exponential smoothing, adaptive filtering, and least square fit.

It also includes several tools for technical analysis: mid-channel support/resistance lines, $\frac{1}{3}$ - $\frac{2}{3}$ speed resistance lines,

trading bands, volume indicators, oscillator charts, and point and figure charts.

Dozens of trending and technical analysis procedures can be applied to a stock or index to help you interpret whether the stock is at a good sell or buy point. And using these techniques on the index can also help you interpret moves in the overall market.

The *Winning On Wall Street* manual adequately describes each technique. It gives you a minicourse in using technical analysis to buy and sell stocks.

Other Charts

In addition to the "standard" high/low/close and volume charts (see Figure 6 for examples), *Winning On Wall Street* includes some useful relative strength and normalized comparison charts.

A relative-strength chart allows you to compare performance of two stocks or a stock and an index over some period of time. Figure 7 compares the performance of Electronic Data Systems (EDS) and Valspar Corporation (VAL) with the Dow Jones Industrial Average. The base stock

(in this example, the Dow Jones Industrial Average) is represented as a straight line graph across the chart. All stocks are normalized to zero on the first day. After that, the base stock remains at a constant or norm while the lines representing the comparison stocks move above and below the baseline depending on that stock's relative performance against the base.

A normalized comparison chart is similar in concept to a relative performance chart, but the baseline represents \$100 worth of a security, purchased on the first day of the chart, instead of an index. Percent changes from the baseline are computed for each stock and graphed over time. Figure 8 shows that EDS has varied from 38 percent below to about 10 percent above its price on October 19, 1983. It shows that VAL did not drop in value as much as EDS did over the period charted but is currently valued about the same as it was on October 19, 1983.

Other interesting *Trader's Forecaster* features are: price/volume relationship charting, (which graphs the relationship between a given stock's price and the volume of trading), point and figure charting, a proprietary matrix projection formula, and an "autorun" feature.

The matrix projection formula is based on a mathematical model invented by Summa Corporation. This projection formula is an objective-setting tool. It seeks to detect the next peak and valley of a securities price. Unlike other analysis tools in the package, this model uses previous highs and lows (rather than charts) to predict the next significant high and the next significant low price. It is discussed in the *Trader's Forecaster* user manual.

The autorun feature is very convenient if you want to track your stocks often and run the same analyses each time you evaluate your holdings. Once you set up this autorun procedure, it will automatically calculate results and chart them on your display or printer. It is used with high/low/close/volume charting, point and figure charting, and matrix projection formula analyses.

Trader's Accountant

One of the major advantages that *Winning On Wall Street* has over *The Technical Investor* is its extensive accounting system. (*The Technical Investor's* accounting module is under development now but will not be ready until the first quarter of 1985.)

I cannot really do justice to the *Trader's Accountant* module in the space I have left. Its data entry, organization, and reporting capabilities are extensive. To use this program, you merely enter data about your stock transactions as they occur. It can handle margin and cash accounts, short sells, sell or buy to cover transactions, or long trades. You can manage up to 999 portfolio accounts, thousands of transactions, all types of securities, special liquid fund accounts, short and long positions, dividends and interest, stock split adjustments, brokers' fees, and margins.

It will automatically calculate realized and unrealized profit and loss, short- and long-term capital gains, brokers' commissions, cash on hand, and more. You can produce the following reports one at a time or through a batch facility that runs while you do something else:

- security transactions detail
- liquid fund transactions
- unrealized profit and loss detail
- realized profit and loss detail
- unrealized profit and loss summary
- realized profit and loss summary
- cash account transactions
- margin account transactions
- tax data/security transactions
- portfolio/liquid fund/security directories.

Samples of all of the reports are given in the manual.

You can also update price information from the *Trader's Data Manager*, either manually or from an information utility.

Simulation Mode

One feature of the *Trader's Accountant* module that merits special attention is something Summa calls "simulation

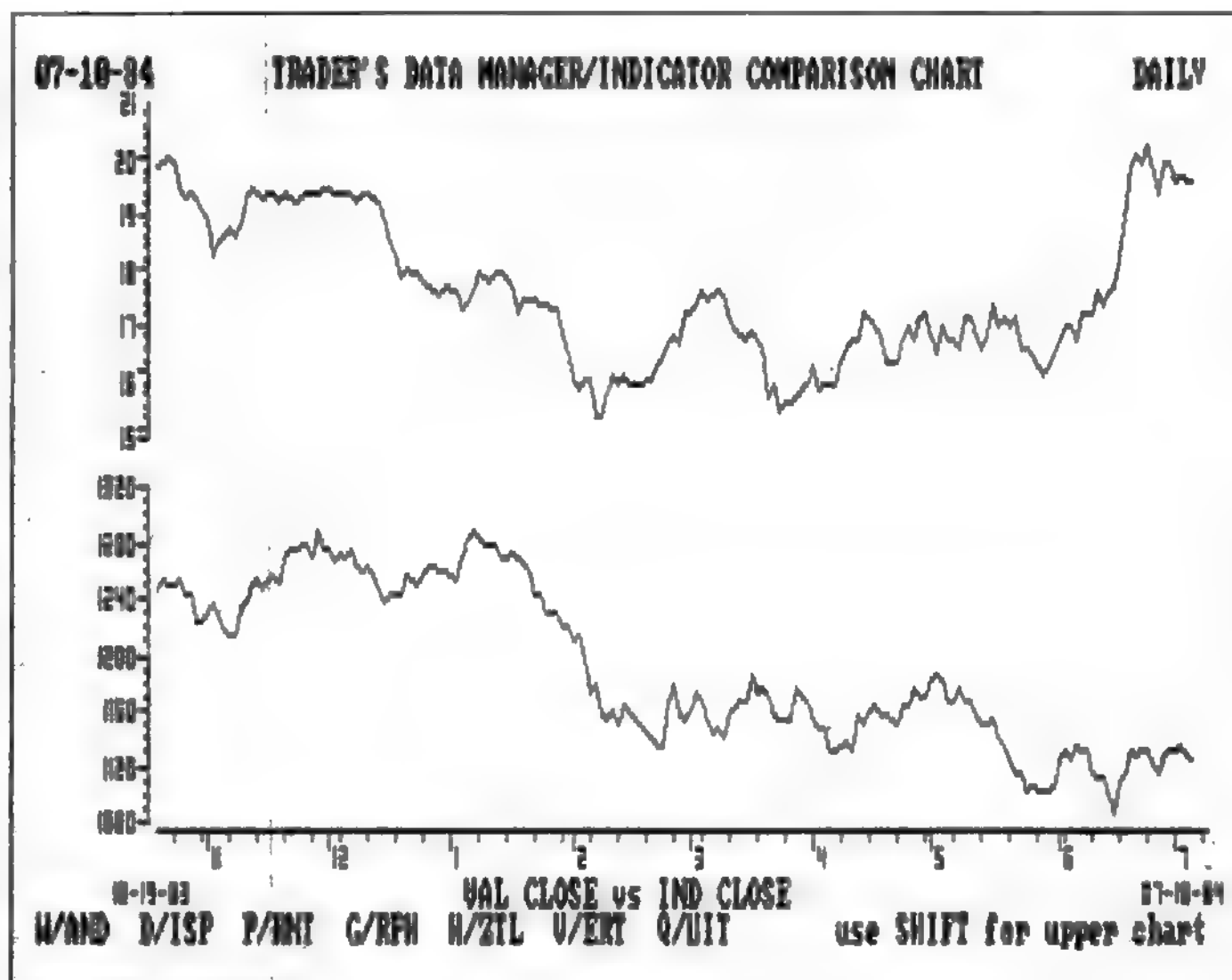


Figure 5: Example of *Winning on Wall Street's* indicator comparison chart. It shows the daily closing price for Valspar Corporation versus the daily closing price for the Dow Jones Industrial Average.

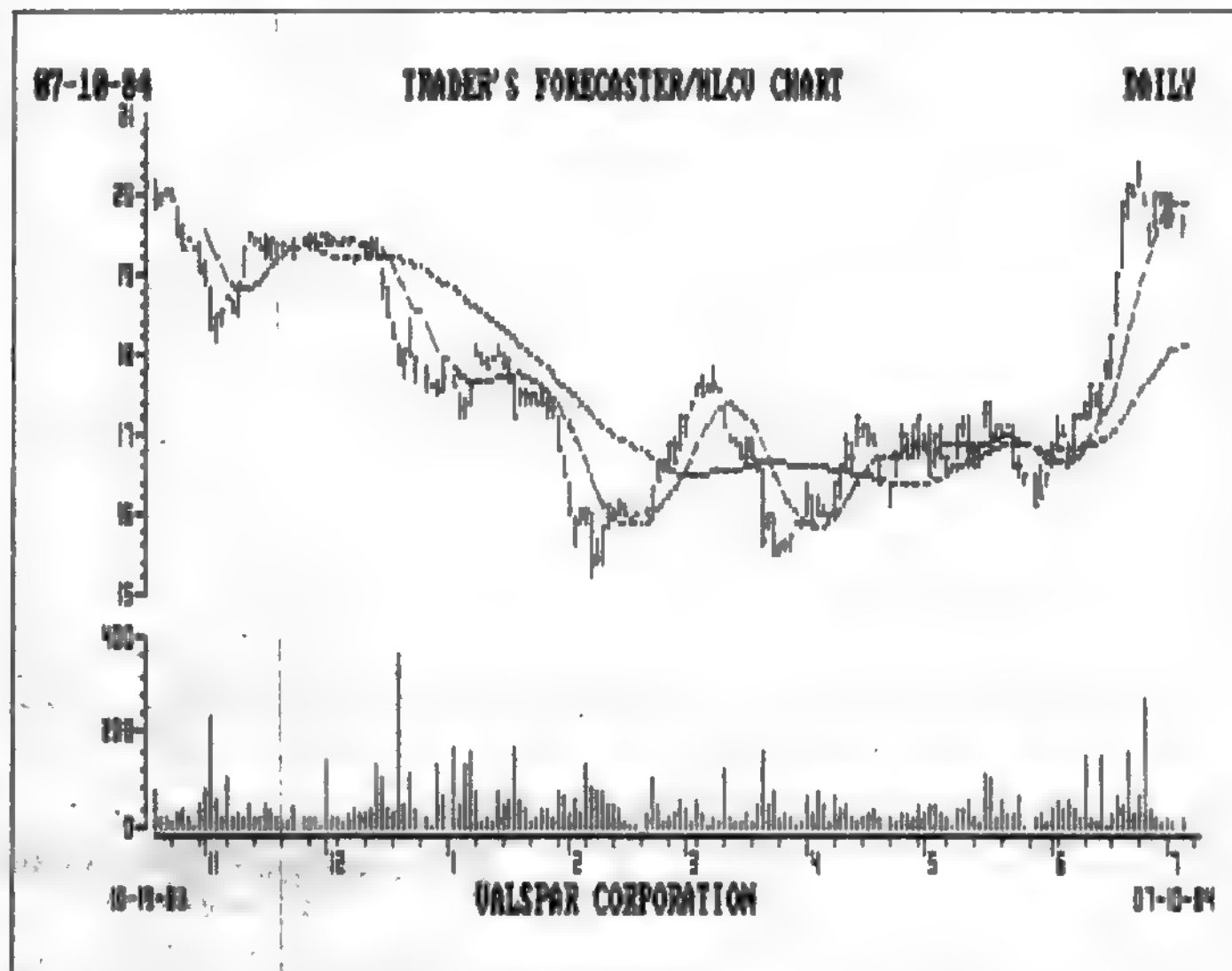


Figure 6: *Winning On Wall Street's* "standard" charts showing Valspar Corporation's daily price and volume data along with a 10- and 30-day moving average of the daily closing price.

It all adds up...

MODEMS		PRINTERS		CARDS	
ANCHOR		BMC		AST RESEARCH	
Volksmodem	\$59 99	BX 80 Dot Matrix	\$269 00	MEGA PLUS II.....as low as	\$299 00
Mark VI	\$169 00	401 Letter Quality	\$589 00	I/O-PLUS II.....as low as	\$139 00
Mark XII (12 Baud)	\$259 00			SIXPAKPLUS.....as low as	\$249 00
HAYES		C.ITOH		MAIN FRAME	
Smartmodem 300.....	\$199 00	Prowriter 8510P	\$339 00	AST-5251.....	\$699 00
Smartmodem 1200B	\$419 00	Son of Starwriter A10P.....	\$869 00	AST SNA	\$699 00
Smartmodem 1200.....	\$489 00	Starwriter F10-40P	\$999 00	AST BSC	\$699 00
SmartCom II.....	\$75 99	Printmaster F10-55P	\$1349 00	AST-3870	\$749 00
Chronograph	\$199 00			MONOGRAPH PLUS	
NOVATION		COMREX		CALL	
J Cat	\$99 99	Comwriter II Letter Quality...	\$449 00	IDEAssociates	
Smart Cat Plus	\$359 00	DAISYWRITER		IEDAboard MPR-64.....as low as	\$219 00
Smart Cat 103	\$179 00	2000	\$949 00	IDEAplus XPR-64 CSP.....as low as	\$279 00
Smart Cat 103/212	\$399 00	DIABLO		IDEAmax ZPR-64 CSP.....as low as	\$279 00
MICROSTUF		36	\$1399 00	IDEAmax ZPR-OK CSP.....as low as	\$229 00
Crosstalk XVI	\$105 00	620 Letter Quality	\$949 00	IDEAcomm CPR-3278	\$799 00
Remote	\$99 99	630-API Letter Quality..	\$1699 00	IDEA 1200 Modem	\$349 00
		630-ECS	\$2099 00	QUADRAM	
MONITORS		EPSON		Quadlink 84K	\$479 00
AMDEK		RX80, RX80FT, RX100	CALL	Quadboard II.....as low as	\$309 00
300 Green	\$129 00	FX80 FX100	NEW CALL	New Expanded Quadboard as low as	\$279 00
300 Amber.....	\$149 00	LQ 1500	LOW CALL	Quad 512 Plus.....as low as	\$259 00
310 Amber IBM Plug.....	\$169 00	JX 80 Color.....	PRICES CALL	Quad 10	\$199 00
Color 300/Audio	\$289 00	IDS		QUADCOLOR	
Color 500 Composite/BRGB VCR	\$389 00	Prism 80-132	CALL	Quadcolor I	\$219 00
Color 600 Hi-Res (640x240)	\$439 00	JUKI		Quadcolor II (640 x 200).....	\$449 00
Color 700 Hi-Res (720x240)	\$499 00	6100	\$469 00	Upgrade I II	\$239 00
Color 710 Long Phosphor	\$699 00	MANNESMANN TALLY		QUADDISK	
BMC		Spirit 80	\$259 00	6, 12, 20, 27, 72 Meg Starting at	\$1799
1201	\$88 99	160L	\$589 00	CHRONOGRAPH	
1201 Plus.....	\$98 99	180L	\$749 00	Clock Calendar	\$89 99
9191 Color Plus.....	\$249 00	NEC		PARALLEL BOARD	
NEC		8027	\$389 00	Printer Interface w/8' Cable	\$89 99
JB 1201 Green	\$139 00	2050	\$899 00	QUADJET	
JB 1205 Amber.....	\$149 00	3550.....	\$1699 00	QJ9000 Ink Jet Printer.....	\$749 00
JC 1215 Color	\$289 00	7730	\$1799 00	MICROFAZER	
JC 1216 RGB	\$429 00	8830	\$1899 00	Call for Configurations...P/P, P/S, S/S, S/P	
PRINCETON GRAPHICS		OKIDATA		Starting at	\$159 00
Max 12 Mono	\$199 00	82, 83, 84.....	CALL	EFAZER	
HX-12 RGB	\$489 00	92, 93, 2380, 2410.....	CALL	Epson Internal Buffers	
SR-12 RGB.....	\$629 00	OLYMPIA		8K	\$69 99
QUADRAM		Compact 2 Letter Quality.....	\$469 00	64K	\$149 00
8400 RGB	\$499 00	Compact RO.....	\$499 00	AMDEK	
TAXAN		ESW 3000	\$1399 00	MAI	\$359 00
100G Green	\$125 00	Needlepoint Dot Matrix	\$329 00	HERCULES	
105A Amber.....	\$135 00	SILVER REED		Color Graphics	\$199 00
121 IBM Green	\$149 00	Letter Quality 500	\$379 00	Monochrome Graphics.....	\$389 00
122 IBM Amber	\$159 00	Letter Quality 550.....	\$469 00	EAGLE	
210 RGB Composite.....	\$269 00	Letter Quality 770	\$869 00	PC Color Card.....	\$229 00
420 Hi-Res RGB	\$469 00	SMITH CORONA		PARADISE	
ZENITH		TP-1000	\$449 00	Multi-Display Card	\$339 00
ZVM 122 Amber..	\$99 99	STAR GEMINI		Modular Graphics Card	\$319 00
ZVM 123 Green	\$89 99	Gemini 10XPC	\$279 00	TAC	
ZVM 124 IBM Amber	\$149 00	Gemini 15XPC	\$389 00	IRMA 3270	\$1049 00
ZVM 131 Color	\$309 00	Radix 10 PC	\$699 00	PC PLUS PRODUCTS	
ZVM 133 RGB	\$429 00	Radix 15 PC	\$899 00	Plantronics Color Plus.....	\$399 00
ZVM 135 RGB Composite	\$489 00	TOSHIBA		PEACOCK	
ZVM 136 RGB.....	\$629 00	1340	\$799 00	For product information	CALL
DISK DRIVES		1351	\$1369 00	TECMAR	
TANDON		TRANSTAR		For product information	CALL
5 1/4" 520K TM 100-2.....	\$189 00	120P	\$469 00	KEYTRONICS	
IDEAdisk		130P	\$649 00	5150 Keyboard	CALL
5MB to 48MB Hard-drives with removable		315 Color	\$459 00	5151 Keyboard	CALL
Cart. Backup.....as low as.....	\$1399 00			MEMORY CHIPS	
"ONE YEAR TRADE-UP"				4164 Ram Chips (set of 9).....	\$49 99
				KOALA	
				Koala Pad w/Micro Painter	\$95 99
				PERSONAL PERIPHERALS	
				Super Sketch Graphics Pad	\$39 99

COMPUTER MAIL ORDER

west



800-648-3311

In NV call (702)588 5654, Dept. 130

Order Status Number 588 5654

P O Box 6689

Stateline, NV 89449

canada

Ontario/Quebec 800-268-3974

Other Provinces 800-268-4559

In Toronto call

(416)828 0866, Dept. 130

Order Status Number: 828 0866

2505 Dunwin Drive, Unit 3B

Mississauga, Ontario, Canada L5L1T1

east

800-233-8950

In PA call (717)327-9575, Dept. 130

Order Status Number 327 9576

Customer Service Number 327-1450

477 E 3rd St., Williamsport, PA 17701



No risk, no deposit on C.O.D. orders and no waiting period for certified checks or money orders. Add 3% (minimum \$5) shipping and handling on all orders. Larger shipments may require additional charges. NV and PA residents add sales tax. All items subject to availability and price change. Call today for our catalog.

the best prices

**CALL FOR YOUR FAVORITE
PC/COMPATIBLE**

SOFTWARE ASHTON-TATE

Framework	\$399.00
dBASE II	\$299.00
dBASE II upgrade	\$149.00
dBase III	\$399.00
Friday	\$179.00

ALPHA SOFTWARE

Electronic Desk	\$219.00
-----------------	----------

CDEX

Training Programs	each \$49.99
-------------------	--------------

CONTINENTAL SOFTWARE

Home Accountant Plus	\$88.99
1st Class Mail	\$79.99

ELECTRONIC ARTS

Get Organized	\$149.00
---------------	----------

FOX & GELLER

OZZ	\$289.00
Grafox	\$199.00
dUtil	\$69.99
dGraph	\$199.00
Quickcode	\$199.00

FUNK SOFTWARE

Sideways	\$39.99
----------	---------

HAYES

Please	\$269.00
--------	----------

HARVARD

Harvard Project Manager	\$229.00
-------------------------	----------

IUS

EasyFiler	\$229.00
EasyPlanner	\$189.00
EasyWriter II (spell/write/mail)	\$249.00

LEXISOFT

Spell Check	\$199.00
Spell Binder	\$269.00

LIFETREE SOFTWARE

Volkswriter	\$115.00
Volkswriter Deluxe	\$179.00

LOTUS

1-2-3	\$319.00
Symphony	\$499.00

MAI

General Ledger	CALL
Accounts Receivable	CALL
Accounts Payable	CALL
Payroll	CALL
Accounting Software	CALL

MICROPRO

WordStar ProPack	\$339.00
WordStar ProPack Plus	\$419.00
WordStar	\$219.00
MailMerge	\$159.00
InfoStar	\$289.00
CalcStar	\$109.00

**Columbia Data
Compaq
Eagle
Sanyo
TeleVideo
Zenith**

**Corporate Buyers
Are Welcome !!!!**



CIRCLE 183 ON READER SERVICE CARD

MICROSOFT

Multi Plan	\$139.00
Multi Tool Word w/Mouse	\$299.00

ULTIMATE INT.

Multi Mate	\$289.00
------------	----------

PEACHTREE SOFTWARE

Peachtext 5000	\$219.00
Peachpack (GL-AP-AR)	\$219.00

PFS

File	\$89.99
Report	\$79.99
Graph	\$89.99
Write	\$89.99
Proof	\$89.99
Access	\$55.99

ROSESOFT

Pro Key	\$89.99
---------	---------

SOFTWARE ARTS

TK Solver	\$279.00
-----------	----------

SSI

Word Perfect	\$279.00
--------------	----------

SYNAPSE

File Manager Plus	\$69.99
-------------------	---------

VISICORP

VisiCalc 4	\$159.00
VisiWord/Spell	\$149.00
VisiFile	\$119.00
VisiSchedule	\$149.00
Desktop Plan	\$199.00
Business Forecast Model	\$75.99
Visi-On Series	CALL

MICROMIM

R Base 4000	\$279.00
-------------	----------

PROFESSIONAL SOFTWARE

PC Plus The Boss	\$279.00
------------------	----------

SPI

Open Access	\$369.00
-------------	----------

SPINNAKER

Fraction Fever	\$24.99
Story Machine	\$24.99
KinderComp	\$22.99
Facemaker	\$24.99
Hey Diddle Diddle	\$22.99
Rhymes & Riddles	\$22.99
Snooper Troops 1 or 2	\$24.99
Search of Most Amazing Thing	\$24.99

INFOCOM

Witness	\$29.99
Enchanter	\$29.99
Planetfall	\$29.99
Suspended	\$29.99
Starcross	\$27.99
Zork 1, 2, or 3	\$27.99
Infidel	\$29.99

CENTRAL POINT

PC Copy II	\$32.99
------------	---------

DISKETTES

MAXELL

MD 1	\$19.99
MD 2	\$29.99

ELEPHANT DENNISON

SS/DD EM-1	\$17.99
SS/DD EM-2	\$21.99
DS/DD EM-5	\$28.99
EMSP-5 DS/DD	\$34.99

VERBATIM

SS/DD...	\$26.99
DS/DD	\$34.99

COMPUTER MAIL ORDER

west

VISA

800-648-3311

In NV call (702)588-6664, Dept. 130
Order Status Number 588 5654
P.O. Box 6689
Stateline, NV 89449

canada

**Ontario/Quebec 800-268-3974
Other Provinces 800-268-4559**

In Toronto call
(416)828-0866, Dept. 130

Order Status Number: 828-0866
2505 Dunwin Drive, Unit 3B
Mississauga, Ontario, Canada L5L1T1

east

800-233-8950

MasterCard

In PA call (717)327-9575, Dept. 130
Order Status Number: 327 9576
Customer Service Number 327-1450
477 E. 3rd St., Williamsport, PA 17701

CANADIAN ORDERS All prices are subject to shipping, tax and currency fluctuations. Call for exact pricing in Canada. INTERNATIONAL ORDERS All orders placed with U.S. offices for delivery outside the Continental United States must be prepaid by certified check only. Include 3% (minimum \$5) shipping and handling. EDUCATIONAL DISCOUNTS Additional discounts are available to qualified Educational Institutions. APO & FPO Add 3% (minimum \$5) shipping and handling.

TECHNICAL SOFTWARE

mode." In this mode, you can do "what if" analysis on all types of buy/sell transactions. You can use it to generate all the reports produced by this program based on hypothetical transactions and hypothetical price updates.

This feature allows you to test your buy/sell decisions and evaluate the affect they will have on the profitability of your portfolio. You can repeat the process more than once to compare a variety of decisions you are considering. And once you have finished with your simulated decisions, you can produce all the resulting reports in a batch. All this analysis and reporting won't affect the status of your real portfolio.

Head to Head

The Technical Investor and *Winning On Wall Street* are both first-class technical analysis investment packages. They are among the best the microcomputer software industry has to offer. It's difficult to recommend one over the other, but here is a point-by-point comparison.

Price

The *Trader's Data Manager* and *Trader's Forecaster* modules of *Winning On Wall Street* are roughly equivalent to the technical analysis and communications features of *The Technical Investor*. But together, the *Trader's Data Manager* and *Trader's Forecaster* modules cost about \$50 more. Both programs have good documentation and include good reference and tutorial material on interpreting and using the results of their analyses.

Both sets of documentation guide you through the package without overwhelming you with detail. I found *The Technical Investor's* tutorial slightly better.

Completeness

As of this writing, *The Technical Investor* does not have a portfolio management and reporting module, whereas *Winning On Wall Street* has an excellent one. Neither package has a fundamental analysis module, although both publishers plan to

A Practical Example

Winning on Wall Street and The Technical Investor helped the author of this review decide to sell two of his stock holdings—at a profit.

I was able to put *The Technical Investor* and *Winning On Wall Street* to practical use while reviewing them. Based on the analysis and charting results produced by both of these packages, I decided to sell two of my stock holdings at a considerable profit.

I was particularly intrigued with the package's point and figure charts and its moving average charts of my two closing prices, which helped me decide to sell my shares of Valspar Corporation (VAL) and Electronic Data Systems (EDS).

I executed these trades on July 6, 1984, based on the historical and current price and volume data I had downloaded from the Dow Jones News/Retrieval Service to both *The Technical Investor* and the *Winning On Wall Street* packages using their built-in communications interfaces.

The figures illustrating the main article were the charts I used to assist me in my decision. As you can see in Figures 3 and 6 of the main article and Figure D here, both stocks had peaked out. They were beginning to fall below their 10-day

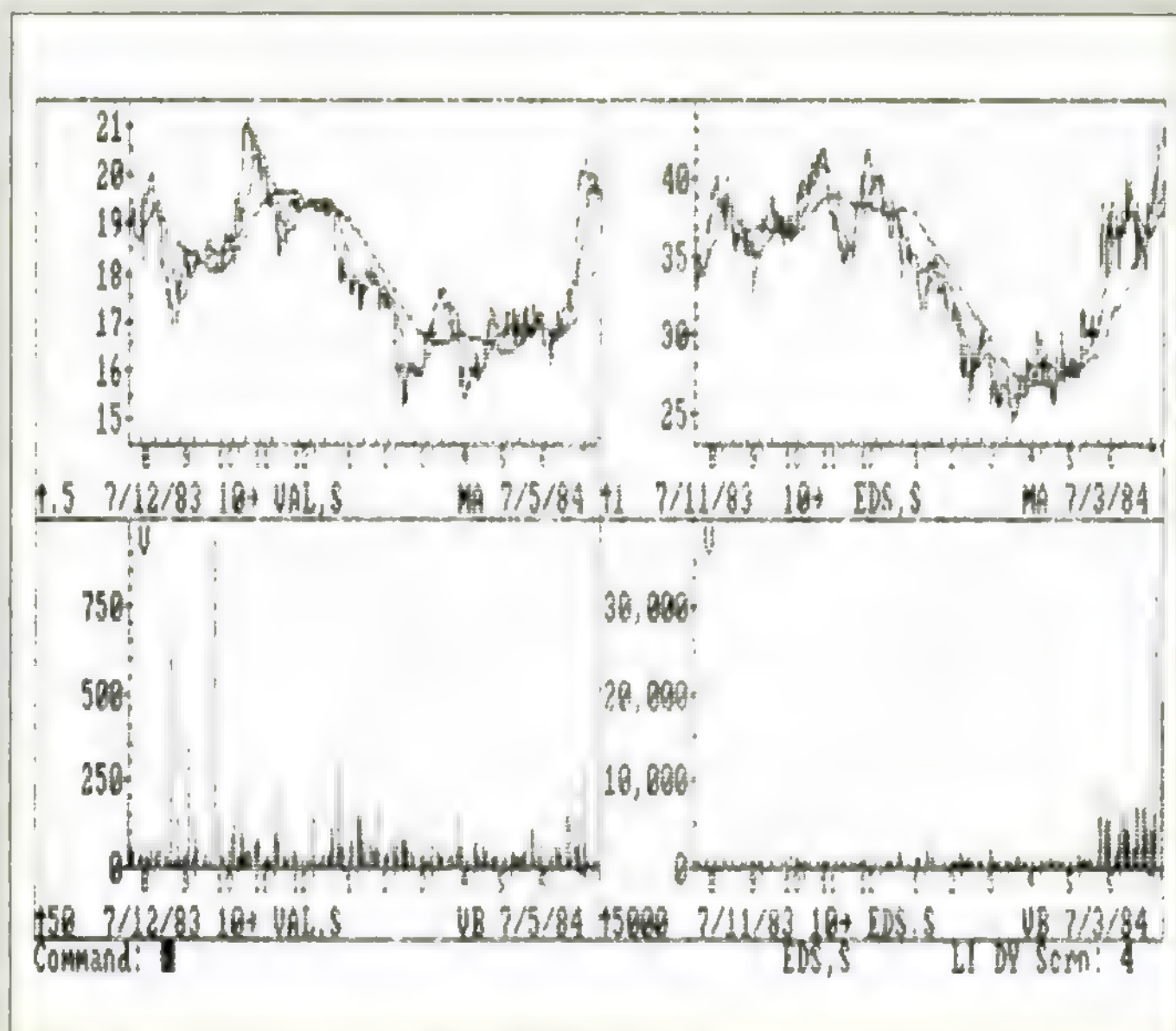


Figure D: Charts produced by The Technical Investor of the 10- and 30-day moving average and volume charts for Electronic Data Systems and Valspar Corporation.

moving averages, but were still well above their 30-day moving averages. The point and figure charts in Figures E and F show some strong "up trends" in effect. (In every point and figure chart there is a fairly significant "stack" of X's in the last column).

Sell, Sell, Sell

EDS and VAL were both exhibiting very "bullish" point and figure trends when they were sold on July 6.

Based on the strong sell signals I was getting from the moving average and the point and figure charts, it was a fairly easy decision to sell these two stocks.

The information I used to make my decisions would have taken many hours of effort had I constructed my charts and analyses manually.

The information I used to make these decisions would have taken many hours of effort had I tried to construct these charts and analyses manually unaided by the software.

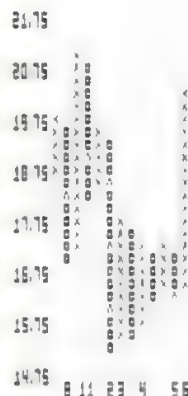
Charts other than the point and figure and moving average charts were also helpful in making these decisions, all of which were produced with only minimal effort on my part. —G.H.



07-11-84

TRADER'S FORECASTER

P&F CHART



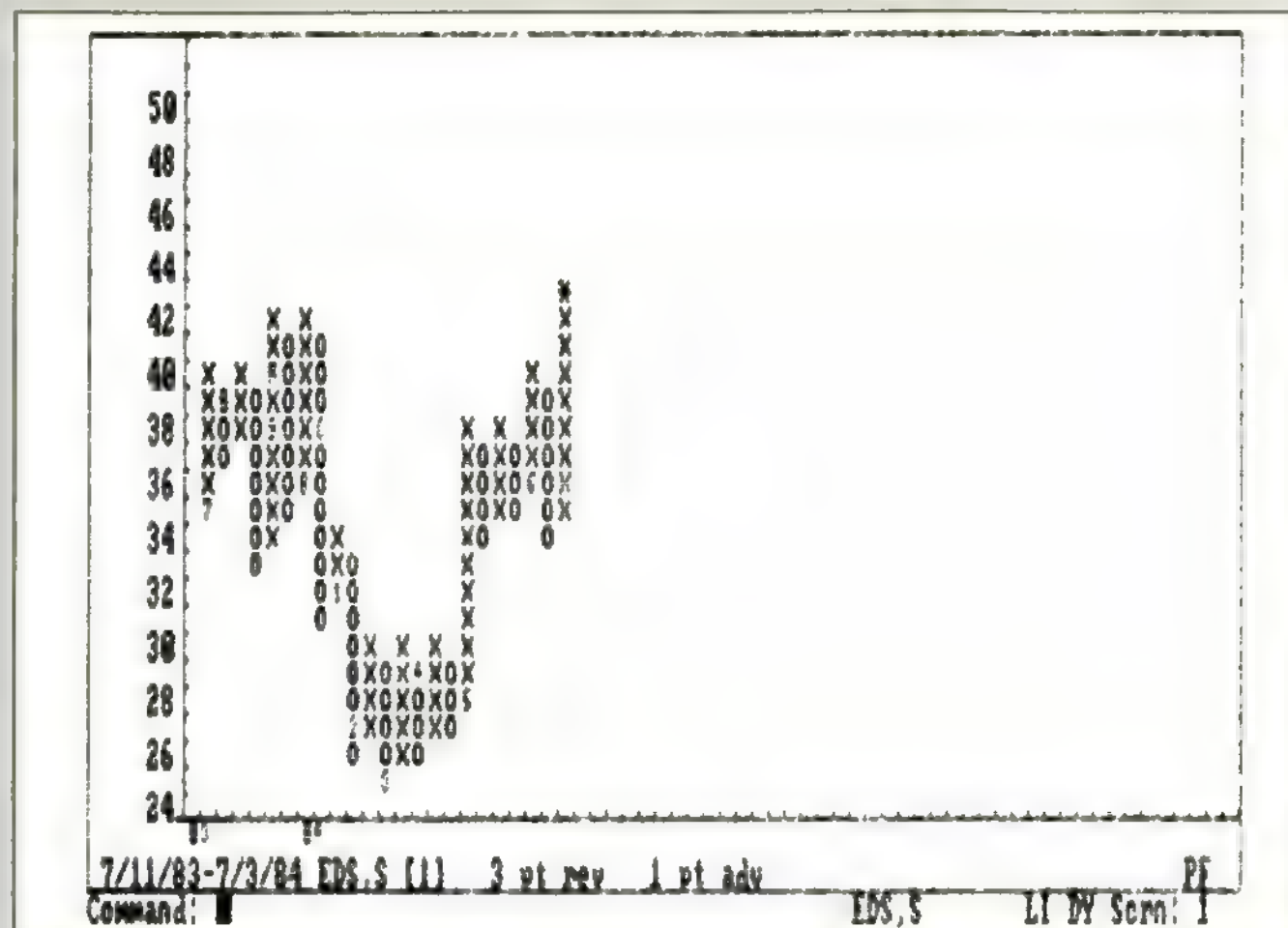
07-05-84

VALSPAR CORPORATION - \$.25 UNIT : 4 UNIT REV

07-05-84

Figure E: Point and figure charts for Valspar Corporation from The Technical Investor (top) and Winning On Wall Street. (Sidebar continues)

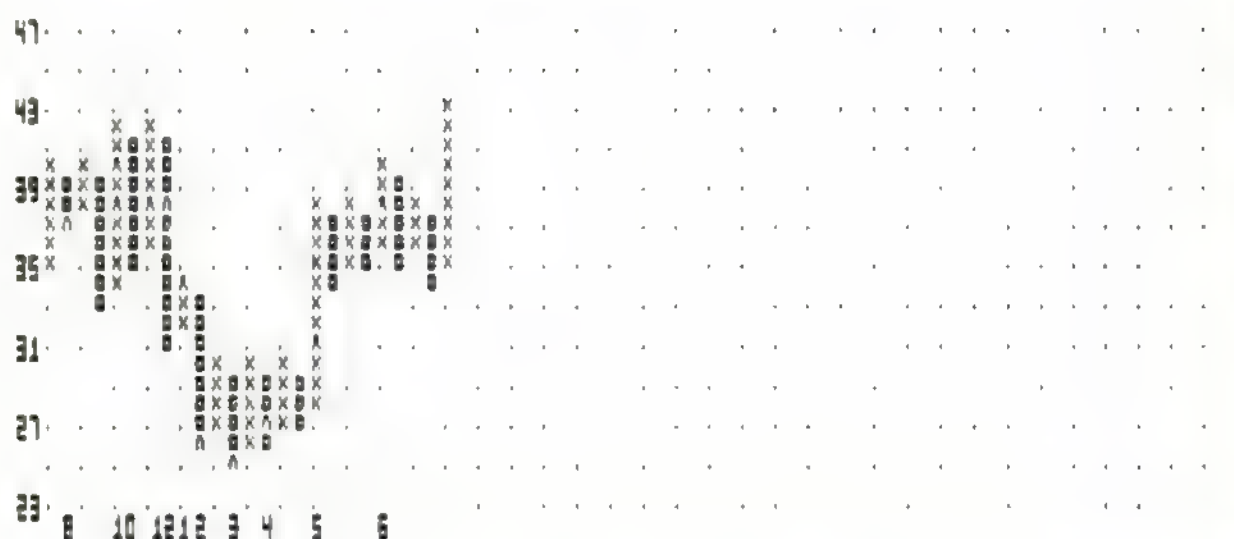
(A Practical Example continued)



07-11-84

TRADER'S FORECASTER

P&F CHART



07-05-83

ELECTRONIC DATA SYSTEMS - \$1 UNIT : 3 UNIT REV

07-05-84

Figure F: Point and figure charts for Electronic Data Systems from *The Technical Investor* (top) and *Winning On Wall Street*.

offer one in the near future.

Despite the extra cost, having the transaction entry and reporting features of *Winning On Wall Street's Trader's Accountant* is worthwhile.

The Technical Investor will soon have a *Spreadsheet Databridge* program that transfers data to and from *The Technical Investor* to Lotus's 1-2-3. I have seen a beta-test version that works well.

Unique Features

Each package offers some unique analysis tools and features. *The Technical Investor* offers a built-in logarithmic mode in addition to a linear mode, commands rather than menus, user-defined macros, a startup file similar to that of DOS's AUTOEXEC.BAT, and function-key-invoked procedures.

Also, *The Technical Investor* handles stock splits more elegantly; when updating stock prices for the split, you can see a chronological list of daily prices for that stock on the screen, so mistakes in entering the date of the split are minimized. *The Technical Investor* can display up to four charts on a screen simultaneously. The most *Winning On Wall Street* can display on one screen is two charts.

Winning On Wall Street offers an adaptive filtering analysis, more extensive comparison analyses, a proprietary matrix projection model for high and low points, an autorun facility, normalized comparison charts, and extensive user-defined formulas.

I find *Winning On Wall Street's* charts more appealing to the eye. It also can convert daily data to weekly data.

Winning On Wall Street loads ten stocks' worth of data from disk into memory at once, so it's very fast in displaying charts to the screen, although batch loading of data from disk to memory is not without its problems.

Also, *Winning On Wall Street* needs a menu at the bottom of the screen that identifies the function keys associated with each stock. You can get a printout of the function keys for a given group of stocks,

but having it available on screen would be a nice feature.

Winning On Wall Street allows you to maintain indicators as well as high/low/close/volume data. For example, you could maintain daily price/equity ratios for each of your stocks and chart this series against others.

Winning On Wall Street is menu-driven rather than command-driven. It is annoying that you must sometimes use the Ctrl key and the Enter key together to enter the data from a screen, and other times just the Enter key. The reason for this inconsistency is not readily apparent.

Winning On Wall Street has a nice feature that allows you to display the high/low/close/volume data for a given day in chart form. You can also easily get a tabular printout for any day.

Communications

Both *The Technical Investor* and *Winning On Wall Street* have superb communications interface setup and downloading capabilities. Automatic data retrieval from information utilities is a breeze with either package. If you have a Hayes Smartmodem, both programs will automatically handle switch settings and the like for the modem interface.

The communications modules in both programs are equally speedy. It took 9 minutes, 17 seconds for *The Technical Investor* and 10 minutes, 24 seconds for *Winning On Wall Street* to sign on, download, and sign off the Dow Jones News/Retrieval service while extracting and writing to disk 1 year's worth of daily data for two stocks.

I would say the programs are equally matched in this area. However, the "express update" feature in *Winning On Wall Street* should save you some initial update time, especially if you often add new stocks to your portfolio.

Package Integration

The Technical Investor is a completely integrated program. It accesses the data through its various modules without your

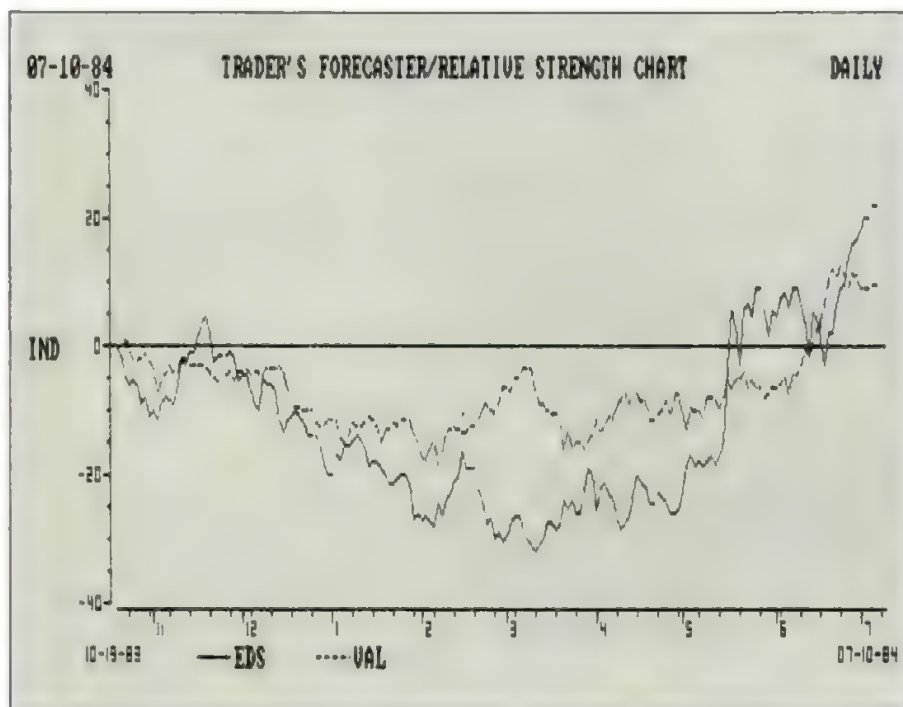


Figure 7: A relative strength chart produced by *Winning On Wall Street*. It compares the daily performance of Electronic Data Systems (EDS) and Valspar Corporation (VAL) with the Dow Jones Industrial Average.

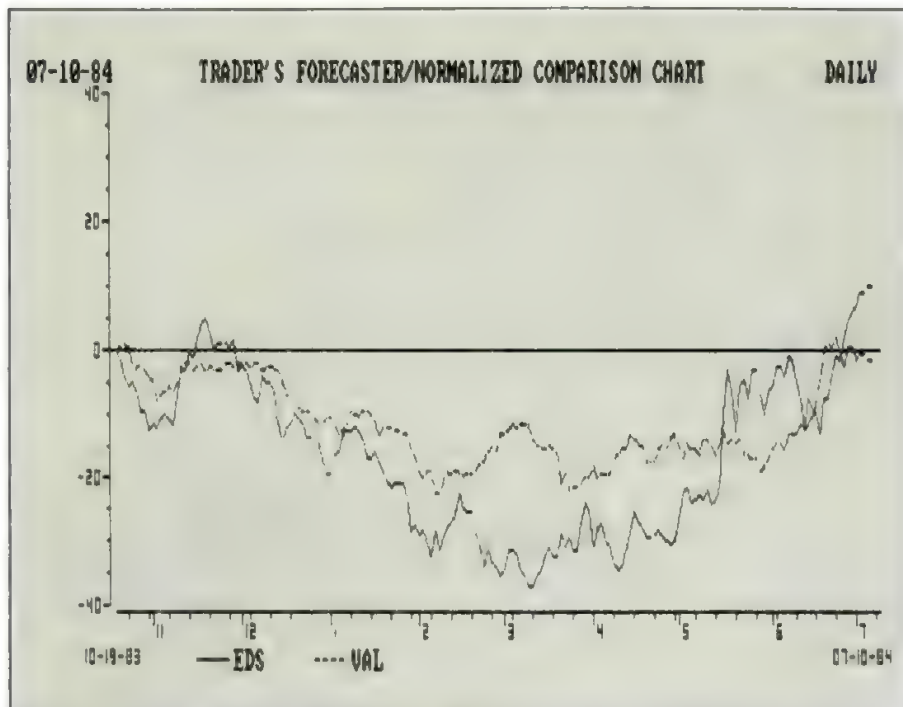


Figure 8: *Winning On Wall Street*'s normalized comparison chart showing the percent increase or decrease in the value of EDS and VAL relative to its price on the starting date of the chart, 10/19/83.



COMPAQ PRESENTS

How To Do More With Less

It used to be that when you wanted personal computers to do more, you added peripherals. A fixed disk for storage. A second monitor for graphics. A backup system for data protection. And slowly the octopus devoured your desk.

But now everything you wanted in a personal computer is *in* a computer. The new COMPAQ DESKPRO™ is here.

There's room *inside* for up to four storage devices. For instance, you could insert two diskette drives, a 10-megabyte fixed disk drive, even an exclusive tape backup system. The new COMPAQ DESKPRO can grow *inside* instead of *out*, saving your desktop.

Plus internal expansion slots will let you add even more functions like local area networking. A mouse. And more.



All that makes COMPAQ DESKPRO the most expandable PC you can buy.

And thanks to some ingenious engineering, the COMPAQ DESKPRO displays high-resolution text *and* graphics on one monitor, not two.

It also runs thousands of business programs made for the IBM® PC and XT straight off the shelf—a full two to three times faster than older, slower computers.

So you can run the most complex software this side of mainframes quicker than you can say, "1-2-3."

We designed the new COMPAQ DESKPRO around the same philosophy that made us the best-selling portable business computer in the world. We simply offer more in less space. For a free brochure or the location of your nearest Authorized COMPAQ Dealer, call toll-free 1-800-231-0900.

It simply works better

COMPAQ
DESKPRO™

TECHNICAL SOFTWARE

having to exit from one module, load another disk, and start another part of the program. Although the fundamental analysis module and the portfolio accounting modules are not available yet, Savant claims that they, too, will be fully integrated. *The Spreadsheet Databridge* will help "integrate" *The Technical Investor* with 1-2-3 as well.

To go from one program to another in *Winning On Wall Street*, you must exit one and start another. This process is easier if you have a hard disk and don't have to worry about swapping disks.

You are, however, able to leave a single data disk in the disk drive. All three of the *Winning On Wall Street* modules use the data disk directly without converting or transferring the data to a new database. However, moving from one program to another is not so easy. For instance, to get

from the *Trader's Data Manager* to the *Trader's Forecaster* you have to escape from several menus back to the *Trader's Data Manager* master menu before you

Winning On Wall Street has a slight edge.

are able to load and execute the *Trader's Forecaster*. Then you may have to go through several other *Forecaster* menus to get to the menu item you need.

Conclusions

Both these packages are superior technical investment analysis tools. You could hardly cram any more analysis tools into

either one. You should be able to find the analysis tools you need in either package, no matter what your trading style.

If you need portfolio accounting integrated into your technical analysis product and you can't wait for Savant to develop *The Technical Investor's* accounting module, then *Winning On Wall Street* is the product for you. If transferring data to 1-2-3 is a priority, then you may want to choose *The Technical Investor* when the *Spreadsheet Databridge* comes out.

My decision between the two is close to a toss-up, but I think *Winning On Wall Street* has a slight edge. Its extra analysis tools, portfolio accounting, "express updating," and attractive charts are real pluses. But you may find *The Technical Investor's* lower price, closer integration, command-driven system, and link to 1-2-3 more attractive. ■

EVENT: COMPETITION OF HI-RES COLOR DISPLAY FOR IBM PC

WHO IS THE WINNER?

You are the
Judges!!

Exceeds 700 dots resolution	★
Ergonomical tilt/swivel	★
Green text mode	★
One year warranty*	★
.31mm pitch CRT	★
2000 characters	★
16 colors (by intensity)	★
FCC class B	★
Direct Plug-in to IBM PC/XT	★
Price \$	699

Quimax PX-IV



— COME TO SEE US —

- San Francisco PC Faire Booth #12
- COMDEX/Fall Las Vegas Booth #M1346

• MONITOR NEWS •

PX-IV TAKES THE GOLD!

By Hyres Vesion

The crowd is ecstatic as Quimax congratulates their Hi-Res champion PX-IV. One observer at the Olympiad Mr. Misty Focus stated, "That PX-IV clearly demonstrated to the competition what a real winner is made of, superior pixel resolution like I've never seen before." Another observer Mr. Hunch Neckacker states "PX-IV displayed tremendous tilt and swivel action that looks fantastic from any position." Finally, Mr. Tex Writer shouts, "PX-IV showed his switching versatility between color and green text display, he really knows how to turn it off and turn it on."

Quimax
SYSTEMS, INC.

568 WEDDELL DR. SUITE 4
SUNNYVALE, CA 94089

408-734-8283 (Sales Manager)
408-734-8476 (Customer
Service Manager)

IBM is a trademark of International Business Machines, Inc. PGS is a trademark of Princeton Graphic systems, Inc.
* See our warranty policy for details.

CIRCLE 201 ON READER SERVICE CARD

Ask your local dealer for a demo.

**BUY HARDWARE AND SOFTWARE AT WHOLESALE +8%,
AND GET 12-21 DAY SOFTWARE RENTALS[†]...**

In just the last few months, *The NETWORK* has saved its members more than \$18,000,000 and processed over 45,000 orders.

**The nation's largest corporations depend on
PC NETWORK!**

On our corporate roster are some of the nation's largest financial industrial and professional concerns *including some of the most important names in the computer industry:*

AT&T	Hewlett Packard
Barclays Bank	Hughes Aircraft
Bell & Howell	IBM
Citibank	Kodak
Columbia University	Multimate
Farm Bureau Insurance	National Opinion
Frontier Airlines	Research Center
General Mills	Standard Oil of Ohio
Gillette	University of Chicago
Harvard University	Veteran's Administration

plus thousands of satisfied consulting firms, small businesses, user groups, municipalities, government agencies and valuable individuals ACROSS THE NATION! Their buyers know that purchasing or renting from PC NETWORK saves them time, money and trouble. They also count on us for product evaluation, professional consultation and the broadest spectrum of products and brands around.

**CALL TOLL FREE
1-800-621-S-A-V-E**

In Illinois call (312) 280-0002

Your Membership Validation Number: A1A5
You can validate your membership number and, if you wish, place your first money-saving order over the phone by using your VISA, MASTERCARD or AMERICAN EXPRESS. Our knowledgeable service consultants are on duty Mon-Fri 8 AM to 7 PM, SAT 9 AM to 5 PM CST.

PERSONAL COMPUTER NETWORK
320 West Ohio
Chicago, Illinois 60610

Call now...Join the PC NETWORK and start saving today!

PRICING MADNESS

Once again, as Federal Express picks up our ad at the very last millisecond before this issue's advertising deadline, **here we sit with dozens of price reductions and new product announcements which have arrived too late for us to let you know.**

Why, our ad manager asks, do we always go through a last minute price update frenzy, just seconds before our ad is due at the publisher, when we know that despite our heroic effort, *many of these products will cost even less by the time you read this ad.*

How he asks, can we get a crystal ball to forecast what fantastic promotions and specials our suppliers are going to offer from now to the date this ad gets to the newsstand **over two months from today?**

Well, we decided that he has a good point. While we'll still keep getting our grey hairs and ulcers from last minute revisions, we will start publishing this notice and ask our readers to make a simple check. Look at any four back issues of this magazine (yes *we're in every one*) and track the prices on the most popular products. **You will see that many drop with every issue.** Most of these price changes were instituted well before the issue was printed and **our members always pay the lower price.** This should prove that this notice is much more than hype.

Given the current madness in the PC industry with its spur of the moment pricing and instant product introductions, **you will find it always pays to call for our latest prices.** You will be glad you did.

GAMES & EDUCATIONAL SOFTWARE

(Please add \$1 shipping and handling for each title ordered from below.)

	Wholesale		Wholesale
Avant-Garde Air Traffic Controller	\$16.95	Serra On-Line Frogger	21.00
Bluebrush Chess / Your Toughest Opponent	34.00	Serra On-Line Crossfire	18.00
Brubrand Lode Runner	19.95	SubLogic Night Mission Pinball	17.00
CBS Goren Bridge Made Easy	48.00	Sponnaker Alphabet Zoo	17.00
CBS Mastering the SAT	81.00	Sponnaker Delta Drawing	29.00
Egypt Temple of Ashtar	21.97	Sponnaker Face-Maker	20.00
Infocom Sorcerer II or III	15.99	Sponnaker Hay Diddle Diddle	17.00
Infocom Deadline Witness or Suspended	27.00	Sponnaker KinderComp	17.00
Microsoft Flight Simulator	27.00	Sponnaker Rhymes & Riddles	17.00
Orion II/Quest / Qbert Look Alike	25.50	Sponnaker Story Machine	20.00
Scrabble / Word Quest / Word Master	27.00	Sponnaker Most Amazing Thing	17.00
Sonybird Asylum (works with mono card too)	15.99	Virtual Communications Micro Clockwork	21.00

BUSINESS SOFTWARE

(Please add \$2.50 shipping and handling for each title ordered from below.)

ATI How to use MultiMate	\$42.00*	Microsoft Word with Mouse - Latest Version	\$55.00*
ATI How to use Microsoft Word	42.00*	Microsoft Multiplan	105.00*
ATI How to use Lotus 1-2-3	42.00*	Monogram Dollars & Sense	89.90*
Auction-Tale DBASE III	CALL	MultiMate MultiMate (latest Version)	240.00*
Ashton Tate - MultiMate	CALL	Open Systems	370.00**
Ashton Tate - MultiMate	138.00*	RDS	705.00*
Central Point	230.00*	Real World - D.A.P.A.N. MultiMate	387.50**
Conceptual Instruments	175.00*	Research - MultiMate	90.00*
Cosmos - MultiMate	375.00*	Ryan McFarland MultiMate - Desktop	570.00*
Digital Research - MultiMate	33.00*	Samma	325.00*
Digital Research - MultiMate	177.00*	Satellite Software - Protect	210.00*
Digital Research - MultiMate	399.00*	Software - MultiMate	125.00*
Digital Research - MultiMate	90.00*	Softstyle	35.00*
Digital Software - MultiMate	36.00*	Software Publishing - MultiMate	72.00*
Harvard	215.00*	Software Publishing - MultiMate	84.00*
Hayes	68.00*	Software Publishing - MultiMate	72.00*
Human Edge - The MultiMate Edge	145.00*	Software Publishing - MultiMate	72.00*
Human Edge - The MultiMate Edge	145.00*	Software Publishing - MultiMate	72.00*
Lotus Development	CALL	TC	72.00*
Lotus Development	230.00*	Verbatim	25.00*
Microsoft	275.00*		

HARDWARE

(Please add shipping and handling charges found in italics next to price.)

[illegible]

*PC NETWORK Members pay just 8% above the wholesale price, plus shipping. All prices reflect a 3% cash discount. Minimum shipping 2.50 per order.

RENT BEFORE YOU BUY—Members are eligible to join The NETWORK's Business and Game Software Rental Libraries and evaluate products for a full 12 (Regular) or 21 (VIP) days to see if it meets your needs. And The NETWORK's rental charges are far less than other software rental services—JUST 20% OF THE MEMBER WHOLESALE PRICE.

Hardware prices highlighted by ■ reflect recent major price reductions

COMPLETE IBM™ PC SYSTEMS

IBM PC STARTER SYSTEM

IBM PC w/64K (256K capacity)

\$1,703.00* (37.00)

Floppy Drive Controller

1 Double Sided Double Density 320/360 Disk Drive

Hercules Color Card w/Parallel Port

Zenith 2VM-123 Display Monitor

CALL FOR
LATEST IBM
ANNOUNCEMENTS

The NETWORK has the perfect starter system for you! The combination of a double sided drive, color card and printer part allows you to run most any program and grow without need for replacing any component you buy now.

IBM PC BASE SYSTEM

IBM PC w/256K

\$1,716.50* (37.00)

Floppy Drive Controller

2 Double Sided Double Density 320/360K Disk Drives

The Base System is your lowest cost starting point for configuring the exact system of your choice. Combine it with any of the monitors, video cards, multifunction cards and accessories listed in this ad, and prove the Network can't be beat as your system source.

IBM PC PROFESSIONAL HARD DISK SYSTEM (XT)

\$2,326.50* (51.50)

IBM PC w/256K

Floppy Drive Controller

1 Double Sided Double Density 320/360K Disk Drive

w/Half Height Disk Subsystem

Half Height 10Mb Drive Allows Room

for Addition of Tape Backup in PC

12 times faster than XT

Automatic Hard Disk Boot Feature

This system increases productivity in any business environment. The 10Mb hard disk eliminates cumbersome floppy disk changes, simplifies operations and dramatically speeds program execution time. The NETWORK's buying power provides you with better than XT performance at a price lower than you'd expect to pay for a standard PC.

CALL FOR
LATEST IBM
ANNOUNCEMENTS

PC Network Members pay just 8% above the wholesale price. These prices have been prepared in August, 1984 and may have changed with new product announcements. Call for latest prices.

Custom Configurations

YOUR SYSTEM EXACTLY AS YOU WANT IT—With the NETWORK'S over 20,000 hardware and software products we can configure a system to your exact specifications. Ask our trained consultants about any drive, monitor, multifunction card or other component which will meet your unique requirements.

LATEST ISSUE REDUCTIONS!

As the NETWORK's volume grows our prices drop. The following popular products are now available at these new lower prices!

64K MEMORY EXPANSION KITS	\$ 40.50* set
Set of 9 chips Guaranteed for Life	
AST Six-Pack Plus with OK	197.00
STAR MICRONICS GEMINI 15X	325.00*
120 CPS Epson Compatible w/Tractor	
Wide Margin Epson Graphics	
TANDON TM100-2 DRIVES	153.00* ea.
TALLGRASS TG3020	2800.00*
20 MB Hard Disk w/25 MB Tape Backup	
ORCHID BLOSSOM/64K installed	205.00*
New Price! Full Six-Pack Features with networking capability	
PANASONIC 1/2 Height Disk Drives with Mounting Kit	250.00* pr.
AMDEK MONITORS	
V300G Composite Green	110.00*
V300A Composite Amber	120.00*
V310A IBM Amber	130.00*
HERCULES MONOCHROME CARD	298.00*
HAYES 1200B	366.90*
C. ITOH STARWRITER F10/40	875.00*
40 CPS-Letter Quality Printer	
BRAND NAME DISKETTES	16.00*
DS/DD Box of 10 Guaranteed for Life	

CALL TOLL FREE 1-800-621-S-A-V-E (Outside U.S. add international charges)

In Illinois call (312) 289-0002 validation code ATAS

CIRCLE 535 ON READER SERVICE CARD

PC NETWORK

... WITH THESE 15 UNIQUE BENEFITS

1 COST+ 8% PRICING—The NETWORK purchases millions of dollars in merchandise each month. You benefit in receiving the lowest price available and all at just 8% above published dealer wholesale price.

2 OUR 400 PAGE WHOLESALE CATALOG—Members receive our 400 page wholesale catalog containing over 20,000 hardware and software products for the IBM PC, APPLE and over 50 other popular computer systems. THE NETWORK'S CATALOG IS THE LARGEST SINGLE COMPILATION OF PERSONAL COMPUTER PRODUCTS AVAILABLE TODAY.

3 IN-STOCK INSURED FAST HOME DELIVERY—The NETWORK maintains a giant multi-million dollar inventory of most popular products, allowing us to ship many orders from stock. Non-stock items are typically maintained in local warehouses just days away from The NETWORK and YOU. We pay all insurance expenses on your shipment. EMERGENCY OVERNIGHT SERVICE IS AVAILABLE ON REQUEST.

4 10 DAY RETURN POLICY—If you are not satisfied, for any reason with any hardware component purchased from The NETWORK within 10 days of receipt, we will refund your entire purchase (less shipping) with no questions asked.

5 MEMBERSHIP SATISFACTION GUARANTEE—If for any reason you are not satisfied with your membership within 30 days, we will refund your dues IN FULL.

6 EXPERIENCED CONSULTANTS—The NETWORK hires consultants, not order takers, to aid you in product selection. Our consulting staff possesses in excess of 150 man years of personal computer product experience. We back our consultants with our money back guarantee: IF ANY PRODUCT RECOMMENDED BY OUR CONSULTING STAFF FAILS TO PERFORM AS PROMISED—OR IS INCOMPATIBLE WITH YOUR SYSTEM—WE WILL TAKE IT BACK AT OUR EXPENSE FOR A 100% REFUND.

7 FREE TECHNICAL SUPPORT—The NETWORK supports every product it sells. We maintain a qualified TECH-SUPPORT staff to help you assemble your system, interpret vendor documentation and get your software and hardware to work. WE WILL GIVE YOU ALL THE HELP YOU NEED, WHEN YOU NEED IT—FREE!

8 OPTIONAL BUSINESS RENTAL LIBRARY—All members can join our BUSINESS RENTAL LIBRARY for just \$25 PER YEAR above the base membership fee. This entitles you to rent business software AT JUST 20% of the DISCOUNTED PRICE FOR A 12 DAY PERIOD. If you decide to keep the software, the entire rental fee is deducted from the purchase price. VIP MEMBERS GET A FULL 21 DAYS for just \$30 above the V.I.P. base fee. This also includes the game library privileges for a \$5 combination savings.

9 OPTIONAL GAME SOFTWARE RENTAL LIBRARY—The Game Rental library is available to members for just \$10 PER YEAR and permits evaluation (or just enjoyment) of any game or educational software product as above.

10 SPECIAL SAVINGS BULLETINS—THE PRINT-OUT—The NETWORK seeks every opportunity to save money for its members. We buy excess dealer inventories, and store bankruptcy closeouts regularly. We then turn around and make this merchandise (only top quality name brand products) available to our members at fantastic savings via THE PRINT-OUT, our newsletter and savings bulletins.

11 DISCOUNT BOOK LIBRARY—Working with numerous publishers and distributors, The NETWORK has assembled a library of over 1000 computer related books and manuals at savings of up to 75% from the normal store price.

12 MEMBERSHIP REFERRAL BONUS—Our most valuable source of new members is you! To date almost 40% of our members have been referred by word of mouth from other satisfied members. For those of you who refer new members, The NETWORK will credit a cash bonus to your account applicable to any future purchase.

13 CORPORATE ACCOUNT PROGRAM—Almost 50% of The NETWORK's members are corporate buyers and users (see opposite page left). The NETWORK can establish open account status and assign designated account managers to expedite orders, and coordinate multiple location shipments.

14 QUANTITY DISCOUNTS—For large corporations, clubs, and repeat or quantity buyers The NETWORK can extend additional single order discounts, when available to us from our manufacturers and distributors.

15 PRICE PROTECTION—The PC industry is crazy!! Prices change not yearly or monthly or even weekly but often day by day! These changes are sometimes up but are mostly down!!! THE NETWORK GUARANTEES THAT IN THE EVENT OF A PRODUCT PRICE REDUCTION, BETWEEN THE TIME YOU PLACE YOUR ORDER AND THE TIME THE PRODUCT SHIPS YOU WILL ONLY PAY THE LOWER AMOUNT!! And remember, for Clients who pay by Credit Card, we never charge your card until the product ships.

Introducing the PC alternatives for the office and the factory.



For Office Control: ISI's 5160.



For Factory Control: ISI's 6160.

More flexible. More functional. More cost effective.

ISI International (formerly Intersil Systems) introduces two new IBM-compatible systems, one for the office and one for the factory.

Each is PC and XT-compatible in both hardware and software. But both offer significant advantages in flexibility, expandability and cost effectiveness.

Office Control: ISI's 5160.

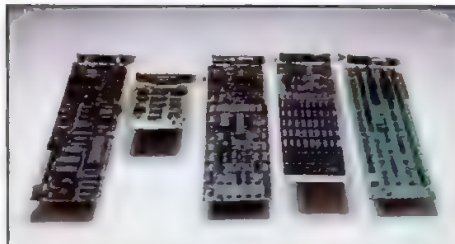
The ISI 5160 office system looks like, and works like, the PC/XT, and it will run the software its more expensive counterpart will run. So you are assured of broad software availability.

But ISI designed the 5160 to be especially flexible in meeting the needs of different sized offices, with differing (and changing) processing requirements.

Expanding all the way from a single floppy to a fully loaded Winchester system is far easier with the ISI system. In fact, over 60 MB of on-line storage capacity is available. Half-height floppies, 10, 20 and 30 MB Winchester drives, cartridge tape backup, and a 130-watt power supply supports expansion.

The first step was to put all the CPU essentials onto the baseboard, leaving more open expansion slots and greater provision to meet users' changing needs. The standard 5160 system includes all these essential features on the baseboard: 8088 CPU and optional 8087 coprocessor; 128K memory (expandable to 640K); calendar/real-time clock with battery backup; two RS-232C ports; parallel printer port; floppy disk controller and SASI interface.

So for an office system that truly offers room to grow, choose ISI International's 5160 office system.



ISI International also offers an expanding array of adapter cards for use with ISI International systems, as well as IBM and other PC-compatible systems.

Factory Control: ISI's 6160.

The ISI 6160 is essentially the same easily expandable processor as the 5160, featuring the same PC and XT-compatibility, but with important additional features that make this the ideal system for factory applications.

For example, it's 19" rack-mountable RETMA enclosure is ruggedly designed and manufactured, and features fan cooling with positive airflow to eliminate hot spots; changeable filters for extra protection from contamination; and a key-lockable cover for limited access to power and reset switches, as well as to the shock-mounted disk drives.

Both the 5160 and the 6160 offer MS-DOS* and GW-Basic;* in addition, the 6160 factory system offers VRTX†; a multitasking kernel that permits you to run real-time, interrupt-driven control applications.

For operation in a more office-like setting, the 6160 can be dressed up in its own "office" style cabinet, just like the 5160. But underneath, it will still be the most versatile, expandable, functional computer available to run factory control applications.

For more information on either the ISI 5160 office system or the ISI 6160 factory system, call us in the West at (408) 743-4442, in the East at (201) 272-3920, or in the Midwest at (513) 890-6450.

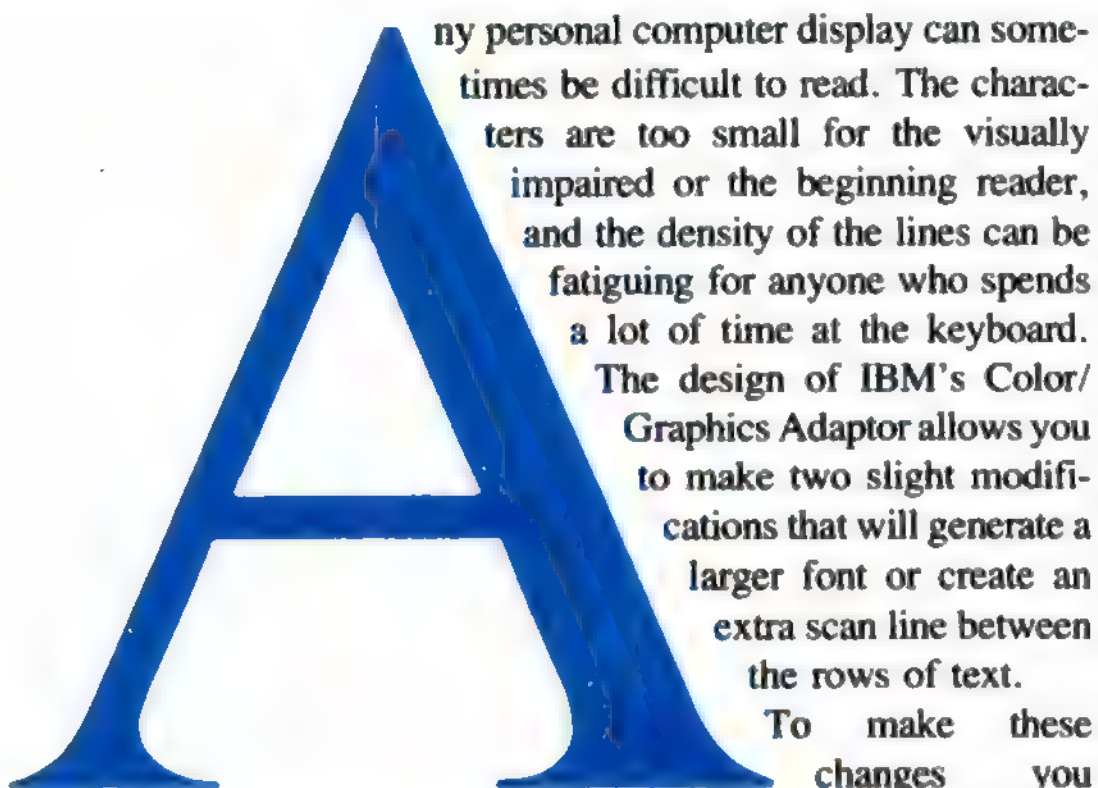


1275 Hammerwood Avenue
Sunnyvale, California 94089, (408) 743-4442
European headquarters, Paris (1) 878.42.25.

*MS-DOS and GW are trademarks of Microsoft Corporation.
†VRTX is a registered trademark of Hunter & Ready, Inc.

▶▶ A Character Set for a More Readable Screen

Make text on your color monitor easier to read by completing these two soldering projects with your adapter. One turns on a larger font, the other adds a blank line between text rows.



ny personal computer display can sometimes be difficult to read. The characters are too small for the visually impaired or the beginning reader, and the density of the lines can be fatiguing for anyone who spends a lot of time at the keyboard. The design of IBM's Color/Graphics Adaptor allows you to make two slight modifications that will generate a larger font or create an extra scan line between the rows of text.

To make these changes you

must have some soldering skills. If you don't, or if you have never worked on a card with pins spaced as closely as this one ($\frac{1}{10}$ -inch apart), you may want to enlist the aid of a skilled friend. You will be inserting wires from the pin side of the card into the card's plated-through holes alongside the integrated circuit leads already in those holes. The pin side is the one without any components; the other side of the card is called the component side. You should use solid, insulated wire, Number 26 or smaller.

Most integrated circuits are designed to withstand 7 seconds of soldering temperatures. If you can't get the wire to enter the

READABLE SCREEN

hole alongside the lead after a few seconds, let it cool and try again. A few of the instructions tell you to connect two wires to the same point. If you can't get both wires to enter the plated-through hole, connect the second one to the first in a T-shape. (Just be sure they don't contact anything else when they're pressed flat against the back of the card.) It may be helpful to first use solder wick or a solder removal tool at all connection points.

References to integrated circuits in the connection list are by circuit number and pin number. The circuit numbers are silk-

screened next to the modules on the component side. They begin with a capital U. When viewed from the component side, integrated circuit pins are numbered counterclockwise starting from the lower left. On both sides of the card, you can identify pin 1 of each module by the dimple in the plastic and by the square pattern around the plated hole. This works for any size module (see Figure 1).

In addition to the hardware modifications, you will have to make some software changes. For both of these projects, I have included a parts list, connection instructions, and source code for the needed programs.

Both of these projects conform to the I/O address map in Section 2 of the *IBM PC Technical Reference* manual (page 2-23 in the July 1982 edition). The new connections will not conflict with any other conforming adapters. Both projects are deactivated when power is initially turned on, so they do not interfere with the PC's use for all applications. Other users need not be aware of the special features you have installed.

Neither modification will place an additional load on the I/O channel. They are designed to minimize the additional load on the power supply and heat dissipation equipment.

A Third, Larger Color Font

The *IBM PC Technical Reference* manual states that the IBM Color/Graphics Adaptor's ROM character generator includes three fonts. Why three fonts? Why not two or four? A little study of the ROM schematic diagrams in the *Technical Reference* manual yields the answer. A 7×7 double- and a 5×7 single-dot font each fill one-fourth of the ROM; the remaining font uses the other half.

The $8K \times 8$ ROM has 13 address bits. In the PC, bit 11, the second-most significant bit, can be switched to select double- or single-dot fonts. (For instructions, see "Single Dots or Double," *PC*, Volume 3 Number 11). Bit 12, the most significant bit, is permanently connected to the +5

volt power supply on the color/graphics card, which means it always applies a logical value of 1.

In fact, the third font is at the lowest addresses in the ROM; the single-dot font is next, and the double-dot font is at the highest addresses. These addresses are illustrated in Figure 2.

As you might expect, a font that takes up twice as much space as the normal fonts must be something special. It certainly is: it's the font used in the IBM Monochrome Adaptor. The characters are 9 dots high by 7 wide, and the ROM also includes blank scan lines that ensure that the descenders on characters such as *g*, *j*, *p*, *q*, and *y* do not make contact with the tops of capital letters on the next line. This third font is much more readable and attractive than the 7×7 dot double-dot font. (These character heights are for the normal capital letters; they do not include descenders.) It's ideal for beginning readers or the visually impaired. In fact, for the visually impaired programmer, use of this font and 40-column mode on a conventional television or monitor is better than any alternative short of a special monitor. Figure 3 shows both the large font and the usual font on the color/graphics adapter. Figure 4 is a BASIC program that simulates the large font. If you're not sure you want to make these hardware changes, you can run this program to see what the large font looks like.

You do, of course, pay a price for everything. Because the color/graphics card and monitors or televisions can display only 200 or so scan lines, when the character height is changed to 13 scan lines from 8, the maximum number of displayable lines is reduced from 25 to 16. Obviously, with only 16 visible lines, any program that assumes 25 visible lines will be writing off the screen a lot. This problem won't damage the hardware, but it is hard to use a program when the only way you can see what you've typed is to issue several carriage returns. The worst environments for the large font are those that place a lot of information on the screen

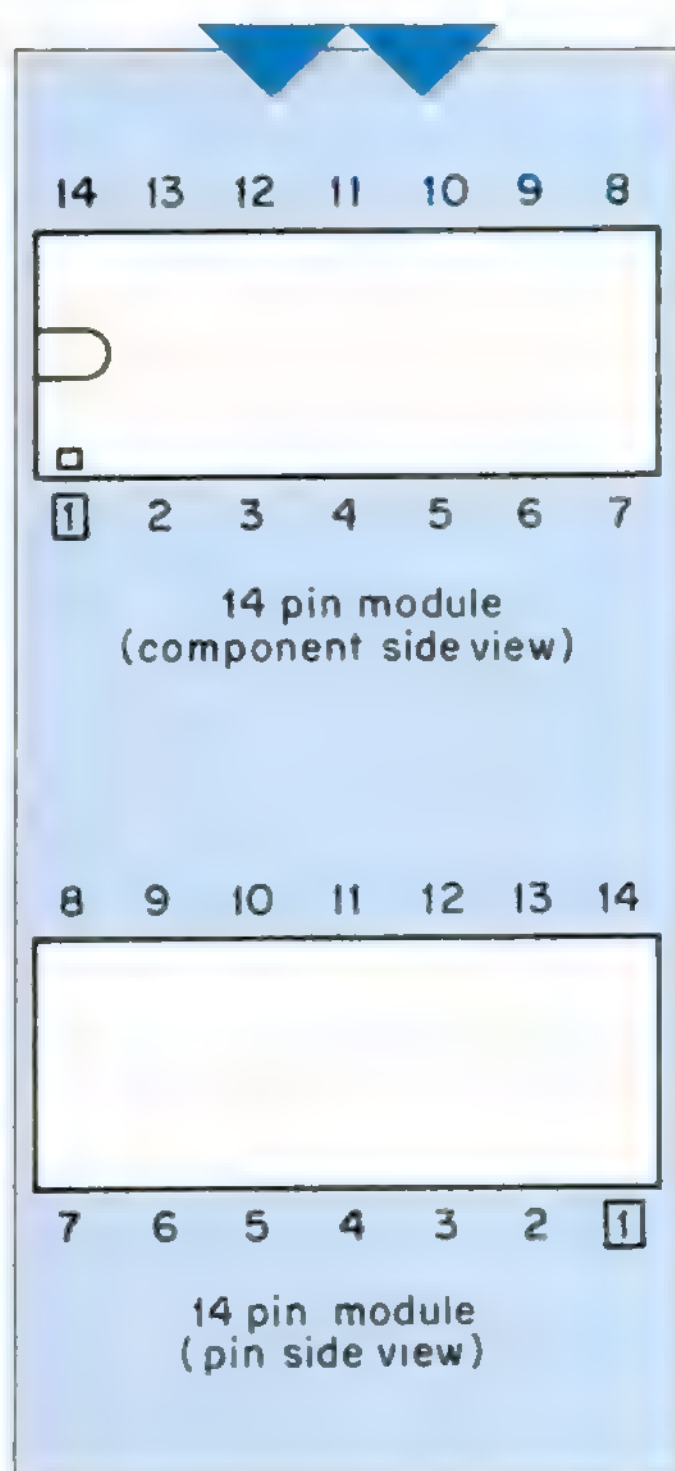


Figure 1: To identify module pins, note the round dimple above pin 1 and the square pattern around the plated hole for pin 1.

and those that scroll the output in typewriter fashion, such as spreadsheets, word processors, and processors like DOS.

The best environments for the large font are those that put only a little information on the screen at a time: database programs like *PC-File*, children's tutorials, or programs you can modify because you have the source code. The very best environment is BASIC. The BASIC supplied with the IBM PC is designed for a variety of displays. You need merely tell it that your display has only 16 lines, and it will cooperatively scroll the screen as soon as the 16 lines are full. To redefine the ending line for BASIC, you merely type:

```
DEF SEG : POKE 92, 16.
```

You must do this coding whether you have loaded the MC6845 registers from BASIC or by changing the parameter tables.

The large font is ideal for the visually impaired individual because it is installed on the hardware. The only other alternative to a special monitor involves graphics mode and mapping of characters to the undefined graphics extension. As long as things are normal, this method is fine, but when an error occurs, you are faced with a standard-size, perhaps unreadable error message from BASIC. When the large characters come from the hardware without software translation, errors will not produce unreadable messages. If you are not visually impaired, the best way to use this font is to enable it only when you wish and to keep the normal 7×7 font as the default when you turn on the power.

This project conforms to the I/O address map in the *Technical Reference* manual; that is, it uses only addresses between 3D0 and 3DF hexadecimal, which are reserved for the color/graphics card. Therefore, it will not interfere with other cards or PC accessories as long as they also obey the rules. Additional power dissipation is less than $\frac{20}{1000}$ of a watt.

I/O addresses are similar to memory addresses, except that the address space is usually used to attach peripheral hard-

ware. Unlike memory, the map is usually not contiguous, in that a device is not necessarily attached at each location.

On the color/graphics card, for example, the MC6845 CRT controller responds to addresses 3D0 and 3D1 (hex). The Mode Control register (used to set text or graphics, 40 or 80 columns, and color or black-and-white) is at 3D8 (hex) and the Color Select register is at 3D9 (hex). The Light Pen Status register may be read at 3DA (hex), and the Light Pen Trigger register may be reset or preset by accesses to 3DB and 3DC (hex), respectively. Nothing is defined for addresses 3D2–3D7 or 3DD–3DF.

The memory map for the 8088 is 1,024K long. It takes 20 bits or five hexadecimal digits to express a number this large. The I/O map is only 64K long. You

can express addresses in 16 bits or four hexadecimal digits. In the IBM PC, the I/O map is further restricted in that only the lowest 10 address bits are used. A maximum of 512 unique addresses is available in the I/O map.

To access the I/O map, you use special instructions. In BASIC, the OUT and INP instructions transfer data to and from the I/O map, the way POKE and PEEK do for the memory map. In assembly language, you use the OUT and IN instructions instead of the all-purpose MOV.

To minimize the amount of added circuitry needed for this project, I have used address-activated selection like that of the Light Pen Trigger. Any access, either an OUT with any data value or an IN, will activate the added latches. Both latches are reset by an access to address 3DD

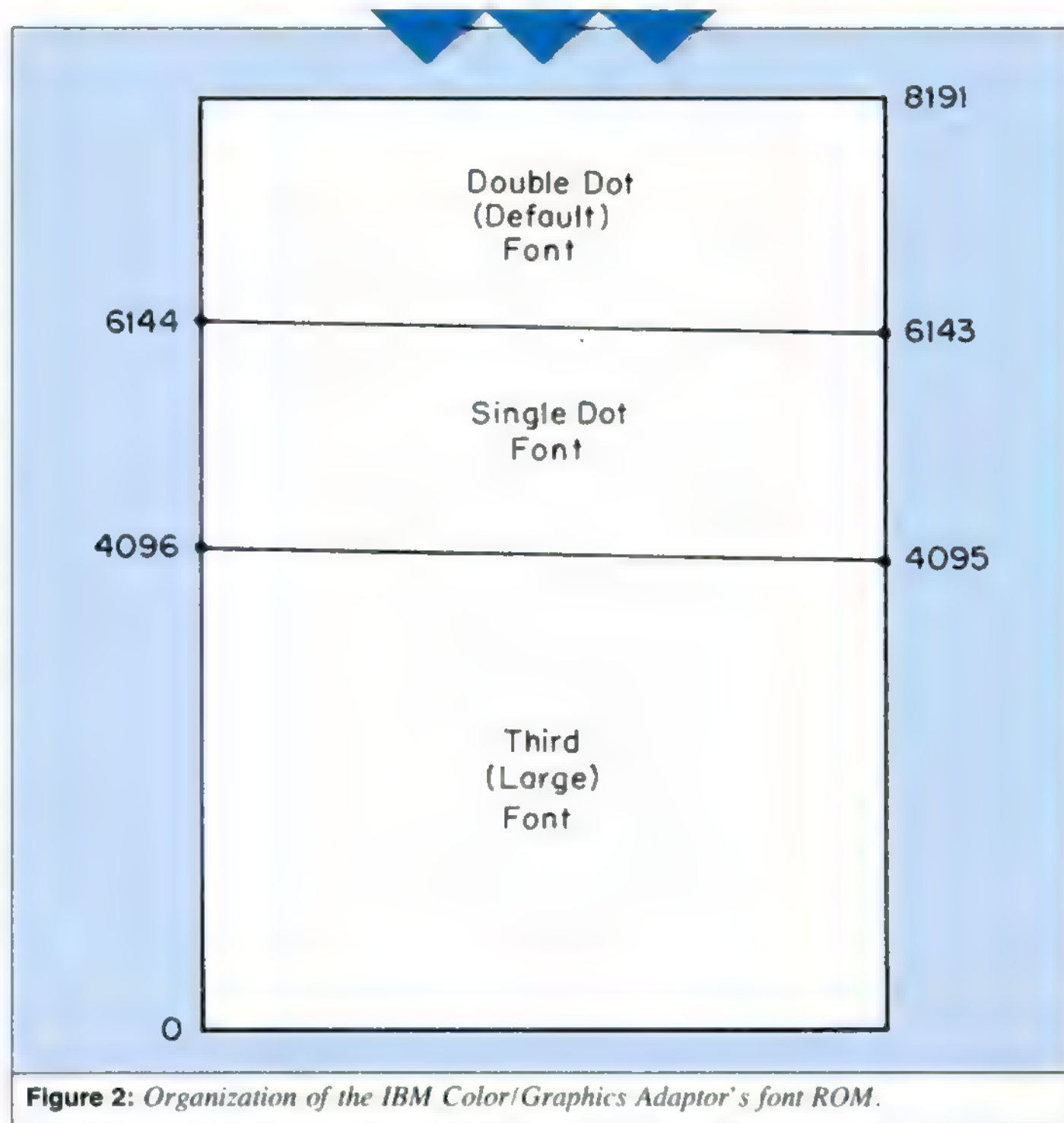


Figure 2: Organization of the IBM Color/Graphics Adaptor's font ROM.

READABLE SCREEN

(hex). An access to address 3DE (hex) enables the single-dot font. To enable the third font you must access both 3DE and 3DF (hex).

You also need to change the parameters programmed into the MC6845 CRT controller. The MC6845 consists of a number of programmable hardware counters (bi-

cursor bounds, and adjustment values are counts of scan lines.

You can't expect a CRT controller programmed for characters 8 dots high to display a font 13 dots high. You must do a little programming and make some additional hardware connections.

The MC6845 has 18 internal registers

requiring modified values are:

Register Number	Register Name	New Hex Value	New Dec Value
4	Vertical Total	13	19
5	Vertical Total Adjust	02	02
6	Vertical Displayed	10	16
7	Vertical Sync Position	12	18
9	Max Scan Line Address	0C	12
10	Cursor Start Register	0B	11
11	Cursor End Register	0C	12

The Vertical Total register (register 4) and the Vertical Total Adjust register (register 5) together determine the vertical sweep frequency. This must be kept constant for most televisions and monitors in order to get an exact 60-hertz vertical refresh rate, which minimizes the annoying ripple that sometimes travels up or down the screen. The integer number of the character line times -1 is programmed into the 7-bit Vertical Total register. The fraction is programmed into the 5-bit Vertical Total Adjust register. For the large font, 20 rows of 13 scan lines each plus 2 scan lines adjustment equals 262 scan lines, the same result as the PC's usual 32 rows of 8 scan lines plus 6 scan lines of adjustment.

The Vertical Displayed register (register 6) is a 7-bit register that contains the number of rows to be displayed. Not all the rows can be displayed; some time must be reserved for sweeping the beam back to the top of the screen and sending sync information. By starting the top row close to the top of the screen, 16 lines can be accommodated. Optional parameters for 17 rows are shown in the listings. If you elect to display 17 rows, you will have to set the Horizontal Sync Position register (register 2) carefully to center the display and to make sure neither end of the top or bottom line is cut off by a CRT corner.

The Vertical Sync Position register (register 7) is programmed in character

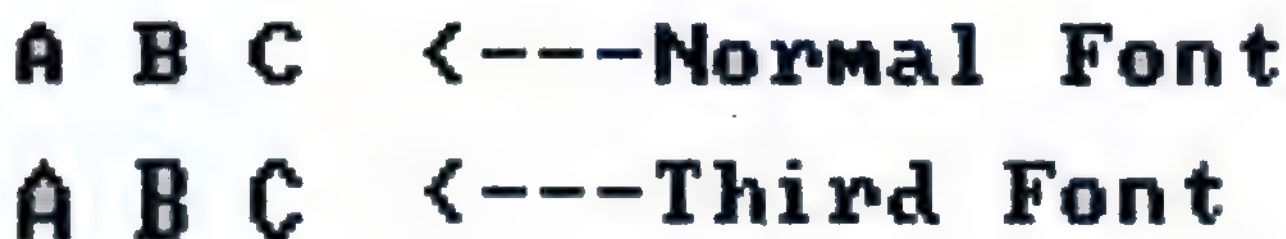
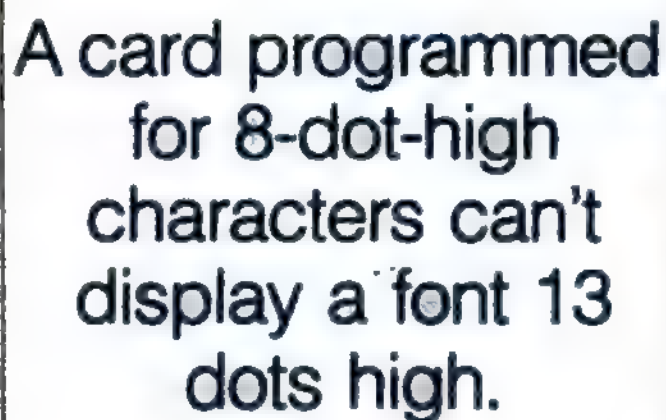


Figure 3: Graphics emulation of the third font.

nary hardware registers that show an increment each time they receive an electronic pulse) and registers with comparison values. In the horizontal direction, for example, as a line is swept across the screen, the controller compares the total line length, the displayed line length, the point at which to add a horizontal sync pulse to the signal, and the cursor location. Each of these values is expressed as a count of characters, and the MC6845 continually compares the values stored in its internal registers to its horizontal counter. When it detects any match, it activates the appropriate hardware.

The vertical direction is trickier. The MC6845 must compare not only total height, displayed height, and vertical sync pulse generation, but also the number of times each character must be reselected as each row of its dots is displayed, the starting and ending lines for the cursor, and an adjustment value that minimizes annoying ripple on the CRT screen caused by interference with the 60-hertz power line. Some of the vertical parameters are expressed in character row counts and some in scan line counts. The total and displayed heights and the sync position, for example, are counts of character rows, while the number of character rescans,

for comparison with the horizontal and vertical counters. They are identified in the *Technical Reference* manual and defined in Motorola's *MC6845 Data Sheets*. The MC6845 has only two addresses in the I/O map. To write to a register, you must first select the register by writing its number to address 3D0 in



the I/O map. You then write the data for that register to address 3D1. For example, to change the Vertical Sync Position register in BASIC, you would type:

```
OUT &H3D0,7 : OUT &H3D1,18.
```

Another example of this access appears in the BASIC manual, under the description of the OUT command. The registers

rows to produce synchronization information for the monitor or television. Modifying the value in this 7-bit register changes the distance on the display screen from the top to the first row of characters.

You may be more familiar with its horizontal counterpart, register 2, which is frequently modified to move the display to the left or right. The default for register 2 is 45 in 40-column mode and 90 in 80-column mode. For most televisions, these settings cause the first character or two to appear off the left edge of the screen, so if you use a television with the color/graphics card, you are probably used to issuing the command sequence:

```
OUT 980,2 : OUT 981, 44.
```

The Max Scan Line Address register (register 9) is the key to this project. This

5-bit register determines the number of scan lines per character row, including spacing. The programmed value is a maximum address and is one less than the number of scan lines. Conceptually, the MC6845 compares this register to the scan line counter at the end of each scan line. When the maximum value is reached, it resets the scan line counter and increases the row count by one.

The Cursor Start register and Cursor Stop register (registers 10 and 11) define the starting and ending rows for the cursor. The lowest 5 bits of these registers define, respectively, the starting and stopping scan lines for the cursor. These are the registers modified by BASIC when you use the LOCATE statement with the fourth and fifth arguments.

All of these values must be inserted into

the MC6845 registers when you select the third font. They will be changed by the BIOS whenever the display mode is changed. For example, in BASIC, the command sequence

```
SCREEN 1 : SCREEN 0
```

will cause the BIOS to reload the default parameters into the MC6845.

There are two ways to attack this problem. You can load the MC6845 after each mode change, a technique appropriate within, say, a BASIC program. Figure 5 is an example of a BASIC program that switches between modes. Each time it is run, it switches to the default font and parameters, and then to the large font. Note that it uses the LOCATE statement to modify the cursor definition. You can also use the BIOS-provided facilities to replace

```
10 'Program Chars-Generate Images of Large Font characters
20 'Copyright (C) 1984 Laurence V. Marks
30 '
40 SCREEN 1,0: WIDTH 40:KEY OFF:COLOR 7,0
50 CLEAR ,&HB000 ' save 32K bytes at end of BASIC for array data
60 DEF SEG = 0 'Set vector to high character table
70 POKE &H7C,0: POKE &H7D,&H80 ' Offset to character data =32K
80 POKE &H7E, PEEK(&H510):POKE &H7F,PEEK(&H511) ' Segment of character data,
  same as BASIC's segment
90 DEF SEG ' Set segment back to BASIC's
100 FOR I=0 TO 46:READ A$: POKE &HB000 + I, VAL("&H"+A$):NEXT I 'Read char data
110 DATA 10,38,6C,C6,C6,C6,FE,C6 'Top of A (See Technical Reference pages)
120 DATA FC,66,66,66,7C,66,66,66 'Top of B (A-75 and A-76 for examples )
130 DATA 38,6C,C6,C0,C0,C0,C6,6C 'Top of C
140 DATA C6,00,00,00,00,00,00,00 'Bottom of A
150 DATA FC,00,00,00,00,00,00,00 'Bottom of B
160 DATA 38,00,00,00,00,00,00,00 'Top of C
170 CLS:LOCATE 12,18
180 PRINT "A B C <---Normal Font"
190 LOCATE 14,18
200 PRINT CHR$(128);" ";CHR$(129);" ";CHR$(130);" <---Third Font"
205 LOCATE 15,18
210 PRINT CHR$(131);" ";CHR$(132);" ";CHR$(133)
220 'FIGURE 3. Sample BASIC program to display large font characters
230 PRINT:PRINT
240 PRINT"      FIGURE 2. Graphics Emulation"
250 PRINT
260 PRINT"
  of the Third Font"
270 A$=INPUT$(1)
280 '
```

Figure 4: A sample BASIC program to display large font characters.

READABLE SCREEN

the default parameters. The BIOS checks memory location 0:74 (hex, corresponding to interrupt vector 1D hex) for a pointer to the parameter tables for the MC6845. You have to replace all four tables even though only two are changed, but the changes then persist through the mode switching. This technique would be appropriate for developing BASIC programs with lots of alternate graphic and text screens. Quitting the graphic mode would automatically restore normal text. Figure 6 is an example of an assembly language program that "installs" a set of new parameter tables at the lowest avail-

able memory address, changes the BIOS pointer to identify the new tables, instructs DOS to reserve memory used by the table (64 bytes), and then returns to DOS. Incidentally, as long as new parameters are being defined, this is the perfect opportunity to change that pesky horizontal sync. Just change the value in the two tables for 40- and 80-column text modes shown in Figure 6. Usually a value one or two less than the defaults in 40-column mode, and two to four less in 80-column mode, is satisfactory.

Naturally, hardware designed to display characters in an 8-dot-high box isn't

exactly ready to display characters in a box 13 dots high. Fortunately, not much modification is needed. The double-dot and single-dot fonts in the MK36000 font ROM are coded so that the three least-significant bits are used to select which of the eight rows in a character to scan. The MC6845 puts out Row Addresses 0 to 2 from its scan line counter that connect to these ROM inputs to select the proper character row. The next 8 bits contain the ASCII character value to be displayed. The next bit, bit 11, selects double- or single-dot codes as long as bit 12 is on (its normal state). Bit 12, the most significant,

```
10 'FONT3.BAS--Program to modify parameters in BASIC and for the Color/Graphics
   Card.
20 'Copyright (C) 1984 Laurence V. Marks
30 DEF SEG=0 'Switch to the Color/Graphics monitor if both installed
40 POKE 1040,(PEEK(1040) AND &HCF) OR &H20
50 SCREEN 1 'This sequence, SCREEN 1:SCREEN 0 causes the standard parameters
60 SCREEN 0 ' to be loaded into the MC6845
70 OUT &H3DD,0 'Reset the double-dots and FONT3 latches
80 LOCATE ,,1,6,7 ' Normal cursor height and position
90 INPUT "Width? (40 or 80)",W:WIDTH W
100 FOR I=1 TO 4:READ A$:PRINT A$;:PRINT A$;:NEXT I
110 PRINT "Strike any key when ready . . ."
120 A$ = INPUT$(1) 'Get a key
130 '=====
140 'The FONT3 setup starts here
150 '=====
160 OUT &H3DE,0 'Set double-dots latch
170 OUT &H3DF,0 'Set FONT3 latch
180 OUT 980,4:OUT 981,19 'Vertical Total
190 OUT 980,5:OUT 981,2 'Vertical Total Adjust
200 OUT 980,6:OUT 981,16 'Vertical Displayed *
210 OUT 980,7:OUT 981,18 'Vertical Sync Position
220 OUT 980,9:OUT 981,12 'Max Scan Line Address
222 ' * Change the 16 to 17 in lines 200 and 270 to display 17 lines
230 '=====
240 'The FONT3 setup ends here
250 '=====
260 DEF SEG 'Addressability to BASIC
270 POKE 92,16 ' Tell BASIC the screen has only 16 lines *
280 LOCATE ,,1,11,12 'Cursor to scan lines 11-12. Could use 6845 regs 10 & 11.
290 DATA The quick brown fox jumped over the lazy
300 DATA DOGS. THE QUICK BROWN FOX JUMPED OVER T
310 DATA DESCENDERS-gjqpygjqpygjqpygjqpygjqpygjqp
320 DATA CAPS-ABCDEFGHIJKLMNPOQRSTUVWXYZABCDEFGHI
```

Figure 5: A BASIC program to reload the MC6845 registers.

```

                                TITLE  Install Video Params and Set Pointer at
                                Int 1DH
                                ; Copyright (C) 1984 Laurence V. Marks
                                PAGE    60,96
                                NAME    Font3
0000      ONESEG                SEGMENT
                                ASSUME CS:ONESEG
0100      ORG                  100H
0100      HERE  PROC          FAR
0100      JMP                  SHORT  START
                                ;=====;
                                ;  CONSTANTS AREA
                                ;=====;
0102      INT_RET LABEL      BYTE
= 0025      DOS_FUNCT        EQU    25H
= 001D      INT_VECTOR       EQU    1DH
= 0074      INT_OFFSET       EQU    INT_VECTOR * 4
= 0076      INT_SEGMENT      EQU    (INT_VECTOR * 4) + 2
= 03DE      SNGL_DOTS        EQU    3DEH
= 0410      EQUIP_FLAG       EQU    410H
= 0000      SET_MODE         EQU    0H
= 00DF      CRT_TYPE         EQU    0DFH    ; 80 Column monitor
= 0000      MODE_SELECT      EQU    0H      ; 40 x 25 black and white
                                ; Could substitute 1H      40 x 25 color
                                ; or                      2H      80 x 25 black and white
                                ; or                      3H      80 x 25 color
                                ;=====;
                                ;  VIDEO PARAMS TABLE
                                ;=====;
0102      VIDEO_PARAMS LABEL BYTE
0102 38 28      DB          38H,28H ; MODIFIED TABLE FOR 40 x 25 DISPLAY
0104 2D          DB          2DH     ; Horizontal Sync Position
                                ; Could be 2C or 2B to shift display
                                ; slightly to the right. See the text.
0105 0A          DB          0AH
0106 13          DB          13H     ; Vertical Total (19 rows of chars)+1
0107 02          DB          02H     ; Vertical Total Adjust (2 scan lines)
0108 10          DB          10H     ; Vertical Displayed (16 rows of chars)
                                ; You could use 11 (17 rows of chars)
                                ; Vertical Sync Pos (18 rows of chars)
0109 12          DB          12H
010A 02          DB          02H
010B 0C          DB          0CH     ; Max Scan Line Adr(12 lines per char)+1
010C 0B          DB          0BH     ; Cursor Start (Line 11)
010D 0C          DB          0CH     ; Cursor Start (Line 12)
010E 00 00 00 00 DB          0,0,0,0
0112 71 50      DB          71H,50H ; MODIFIED TABLE FOR 80 x 25 DISPLAY
0114 5A          DB          5AH     ; Horizontal Sync Position
                                ; Could be 56 - 59 to shift display
                                ; slightly to the right. See the text.
0115 0A          DB          0AH
0116 13          DB          13H     ; Vertical Total (19 rows of chars)+1
0117 02          DB          02H     ; Vertical Total Adjust (2 scan lines)
0118 10          DB          10H     ; Vertical Displayed (16 rows of chars)
                                ; You could use 11 (17 rows of chars)

```

(continued)

Figure 6: An IBM Macro Assembler program to replace the default MC6845 parameters.

READABLE SCREEN

selects the third font. If bit 12 is off, the large font is selected and bit 11 is used as the fourth count bit to select scan lines beyond the eighth line. To display the third font properly, bit 11 must be connected to the MC6845 Row Address 3, which is currently unused. Therefore, to switch modes selectively, you must be able to switch ROM address 12 on or off and switch ROM address 11 among three positions: on, off, or connected to Row Address 3.

(I have assumed, in describing this project, that you have made the modifications to the color/graphics card described in "Single Dots or Double," *PC*, Volume 3 Number 11. If you have not done so, the connection list for that project is also included here.)

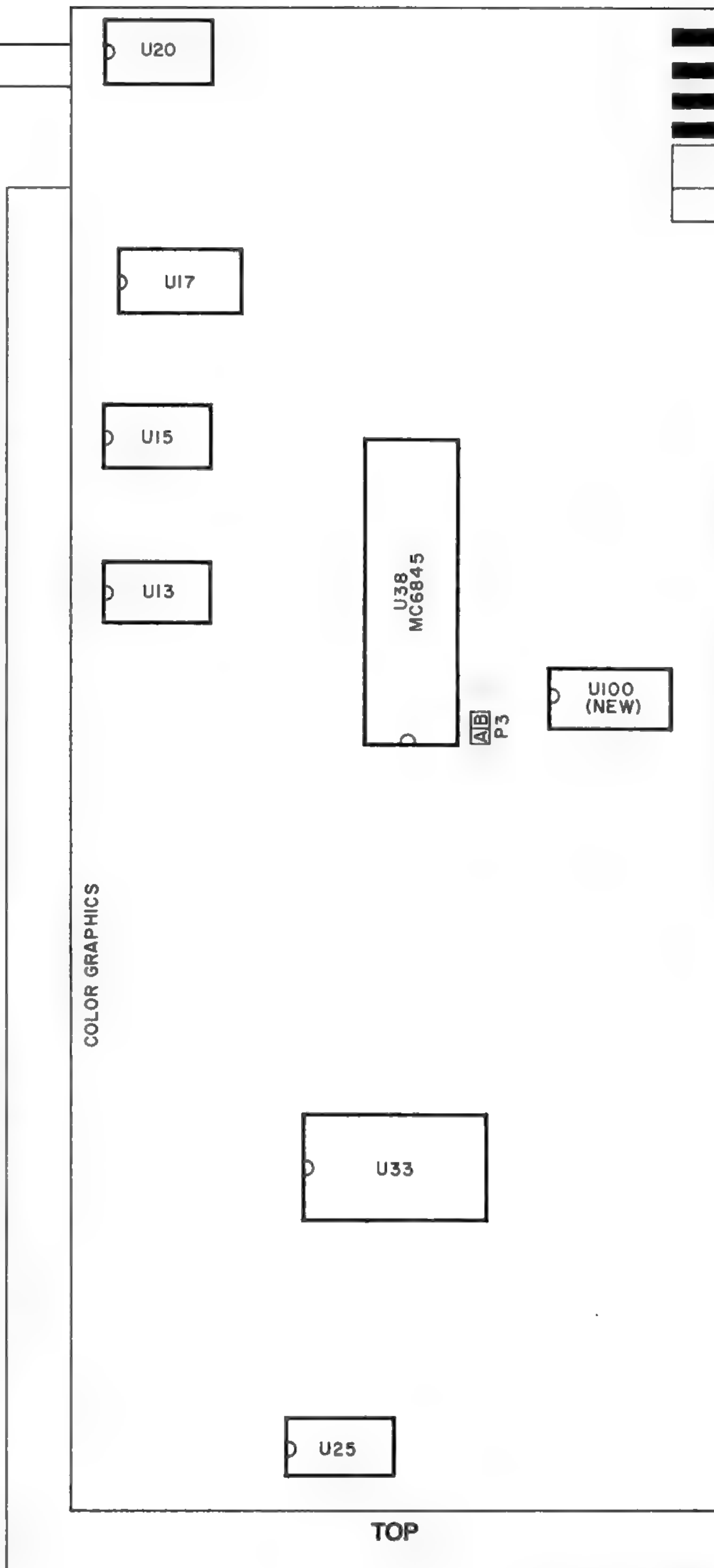
There aren't quite enough unused circuit portions on the unmodified color/graphics card to complete this project, but there is room to add one module. Fortunately that's just enough. You will need an SN74LS00 integrated circuit. This 14-pin circuit contains four NAND portions and should cost less than 50 cents. It's available at any electronics parts store.

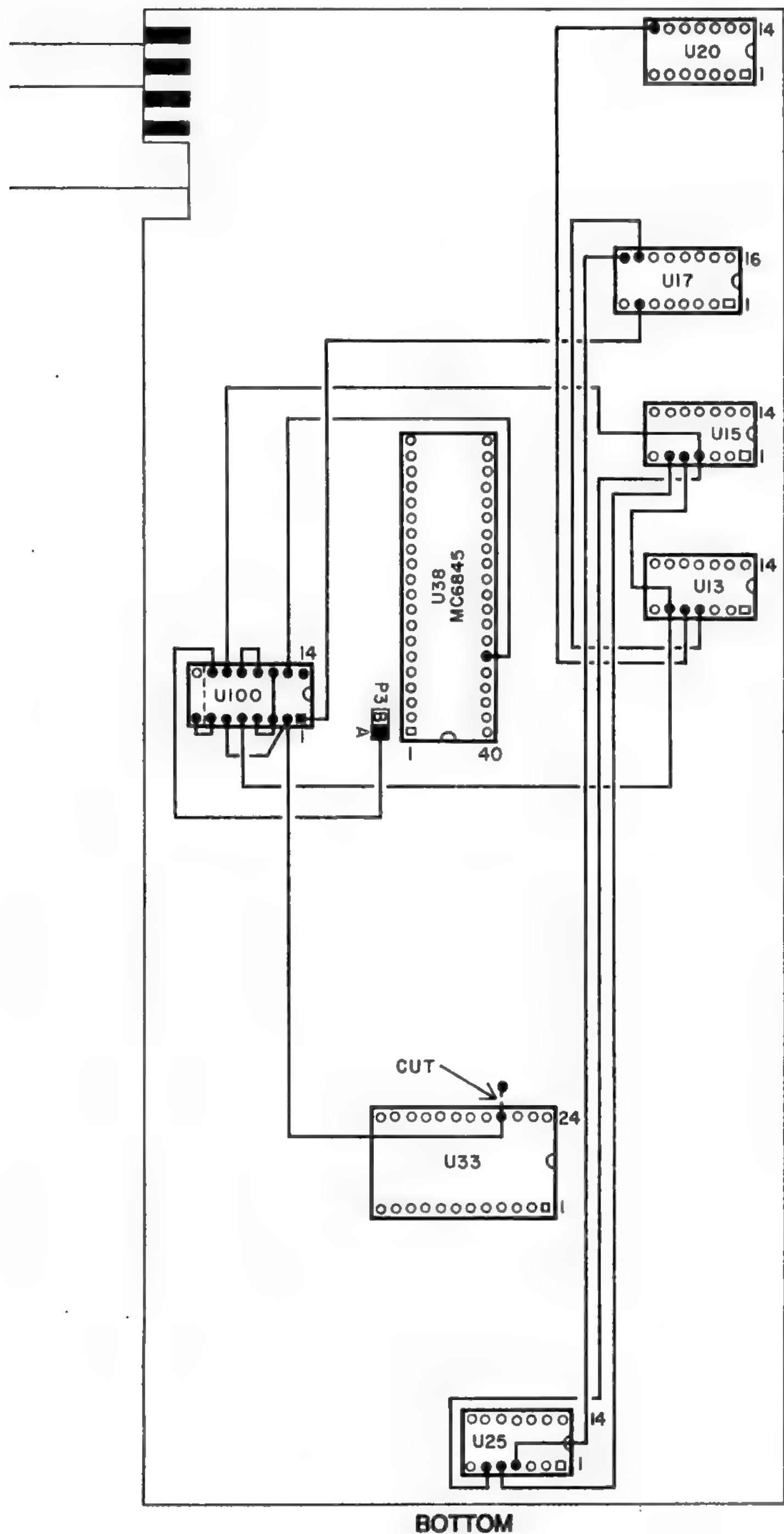
Connection Instructions

Wiring additions in the steps below should be made to the underside (pin side) of the color adapter card. I have provided the Component Side Layout and the Pin Side Layout to keep you from losing your way among the myriad integrated circuit connections on the board. If you have previously completed the double-dot/single-dot project, remove the wire from U15, pin 6 to point P3A (the jumper point near pin 1 of the MC6845).

If you have not previously completed the double-dot/single-dot project, then do the following:

This top (component) side layout of the color adapter board shows the integrated circuits affected by the third font wiring changes. The bottom (pin) side layout of the affected portion of the board shows the new third font wiring.





1. Connect U17, pin 9 to U25, pin 4.
2. Connect U25, pin 6 to U15, pin 4. (Another wire will be attached to U15, pin 4.)
3. Connect U15, pin 6 to U25, pin 5.
4. Connect U13, pin 6 to U15, pin 5. (Another wire will be attached to U13, pin 6.)
5. Connect U17, pin 10 to U13, pin 4.
6. Connect U20, pin 8 to U13, pin 5. (If there is a wire here, don't remove it. Just add the new wire.)

In either case:

1. Cut the trace that connects the +5 volt power supply to U33, pin 21. This is address 12 for the font ROM. The trace is about 1/4-inch long and 1/8-inch wide, much wider than most of the traces. It runs horizontally from U33, pin 21 toward the black metal card-mounting tab on the pin side of the card. Carefully cut between the two plated holes on it to open the circuit. Use a single-edge razor blade or a craft knife. Make several scores to open a good gap.
2. The SN74LS00 will be mounted at the previously unused socket space at U100. Clean the 16 plated-through holes with a solder removal tool, toothpick, solder wick, or by the heat-and-blow-and-tap method.
3. Insert the module at U100, or insert a 14-pin socket if you elect to use one. The module should be placed closest to the top of the card, leaving the two holes closest to the bottom of the card empty. (U100 was designed to accommodate a 16-pin integrated circuit.) You should orient it the same way as the other modules on the card; that is, pin 1 should be closest to the top of the card. Solder pin 14 to hold the module in place. This is the +5 volt supply connection.
4. Connect U100, pin 7 to the empty hole next to it. Pin 8 would be there if U100 were a 16-pin module.
5. Connect U17, pin 7 to U100, pin 1.
6. Connect U13, pin 6 to U100, pin 5.

READABLE SCREEN

(Figure 6 continued)

0119 12	DB 12H ; Vertical Sync Pos (18 rows of chars)
011A 02	DB 02H
011B 0C	DB 0CH ; Max Scan Line Adr(12 lines per char)+1
011C 0B	DB 0BH ; Cursor Start (Line 11)
011D 0C	DB 0CH ; Cursor Start (Line 12)
011E 00 00 00 00	DB 0,0,0,0
	; UNMODIFIED GRAPHICS TABLE
0122 38 28 2D 0A 7F 06	DB 38H,28H,2DH,0AH,7FH,6,64H,70H,2,1,6,7
64 70 02 01 06 07	
012E 00 00 00 00	DB 0,0,0,0
	; UNMODIFIED 80 x 25 TABLE
0132 61 50 52 0F 19 06	DB 61H,50H,52H,0FH,19H,6,19H,19H,2,0DH,0BH,0CH
19 19 02 0D 0B 0C	
013E 00 00 00 00	DB 0,0,0,0
= 0040	TABLE_LENGTH EQU \$-VIDEO_PARMS
	;=====;
	; Everthins after here is not kept resident in memory ;
	;=====;
	ASSUME CS:ONESEG,DS:ONESEG,SS:ONESEG
0142	START:
	;=====;
	; Set up for return to DOS ;
	;=====;
0142 1E	PUSH DS
0143 33 C0	XOR AX,AX
0145 50	PUSH AX
	;=====;
	; Relocate the Video Params Table into the PSP. ;
	; That is, copy it over, 256 bytes earlier in memory. ;
	; This will avoid reserving 256 bytes of wasted memory ;
	; ahead of the table. ;
	;=====;
0146 FC	CLD
0147 B9 0040	MOV CX,TABLE_LENGTH
014A BC C0	MOV AX,ES
014C 2D 0100	SUB AX,100H
014F BE C0	MOV ES,AX
0151 33 FF	XOR DI,DI
0153 BE 0102 R	MOV SI,OFFSET VIDEO_PARMS
0156 F3/ A4	REP MOVSB
	;=====;
	; New Interrupt ;
	;=====;
0158 06	PUSH ES
0159 1F	POP DS
015A 33 D2	XOR DX,DX
015C B8 251D	MOV AX,DOS_FUNCT * 256 + INT_VECTOR
015F CD 21	INT 21H
	;=====;
	; Set the latches on the Color/Graphics Card ;
	;=====;
0161 BA 03DE	MOV DX,SNGL_DOTS ; Set latch at 3DDH
0164 EE	OUT DX,AL
0165 42	INC DX ; Set latch at 3DEH
0166 EE	OUT DX,AL

(continues)

(There is a wire at U13, pin 6 already.)

7. Connect U100, pin 3 to both U100, pin 4 and U100, pin 12.
8. Connect U100, pin 2 to both U100, pin 6 and U33, pin 21.
9. Then connect U38, pin 35 to U100, pin 13.
10. Next connect U100, pin 11 to U100, pin 10.
11. Connect U100, pin 9 to U15, pin 4. (There is a wire here already.)
12. Connect U100, pin 8 to point P3A. (This is one of the pair of points labeled P3. It is the one farthest from the metal card-mounting tab and near U38, pin 1.)

Figure 7 shows the completed circuit.

An Extra Blank Line

If you use applications with a lot of upper- and lower-case letters, you may have noticed that there is no room on the display between rows. The characters theoretically are 7×7 characters in an 8×8 box. However, this 7×7 figure does not include the character descender. Lower-

case characters with tails, such as *g, j, p, q,* and *y* use the otherwise-blank eighth row. If one of these characters appears above a full-height character, such as *f, h,*

The hardware change needs no initialization and is invisible until the MC6845 CRT controller parameters are changed.

or any uppercase character, the two characters contact, making the screen difficult to read.

Any personal computer designed for use with a television as its display must squeeze a maximum amount of informa-

tion into a television's 200 or so usable raster scan lines. The IBM Color/Graphics Adaptor needs to be able to display 25 rows of characters to be compatible with the monochrome adapter and display. Its dense display is a result of these requirements.

This project will add one scan line between the rows to display the 7×7 characters in a 9×8 box instead of an 8×8 box. Figure 8 shows both types.

This project is compatible with the one described in "Single Dots or Double" (PC, Volume 3 Number 11), and the third font project in the first half of this article; neither of those needs to be installed on your PC in order to change to a 9×8 character box. The hardware change needs no initialization and is invisible until the MC6845 CRT controller parameters are changed.

The MC6845 CRT controller must be reprogrammed to display 9 scan lines before advancing to the next character row. Unfortunately, the total number of displayed lines must be modified as well. The color/graphics card can display about 200 scan lines on a monitor or TV. This

(Figure 6 continued)

```
0167 33 C0
0169 BE C0
016B 26: 80 0E 0410 30
0171 26: 80 26 0410 DF
0177 BB 0000
017A CD 10
```

```
017C BA 0040
017F CD 27
0181 CB
0182
0182
```

```

;=====;
; Set Color Mode and... ;
; Do a Video Interrupt to assure the parms are read ;
;=====;
XOR     AX,AX
MOV     ES,AX
OR      BYTE PTR ES:EQUIP_FLAG,030H      ; Both bits on
AND     BYTE PTR ES:EQUIP_FLAG,CRT_TYPE ; Turn one off
MOV     AX,SET_MODE * 256 + MODE_SELECT
INT     10H                               ; Video Interrupt
;=====;
; Other one time code could go here ;
;=====;
; Terminate back to DOS but remain resident ;
;=====;
MOV     DX,TABLE_LENGTH
INT     27H
RET
HERE   ENDP
ONESEG ENDS
END     HERE
```

(Figure 6 ends)

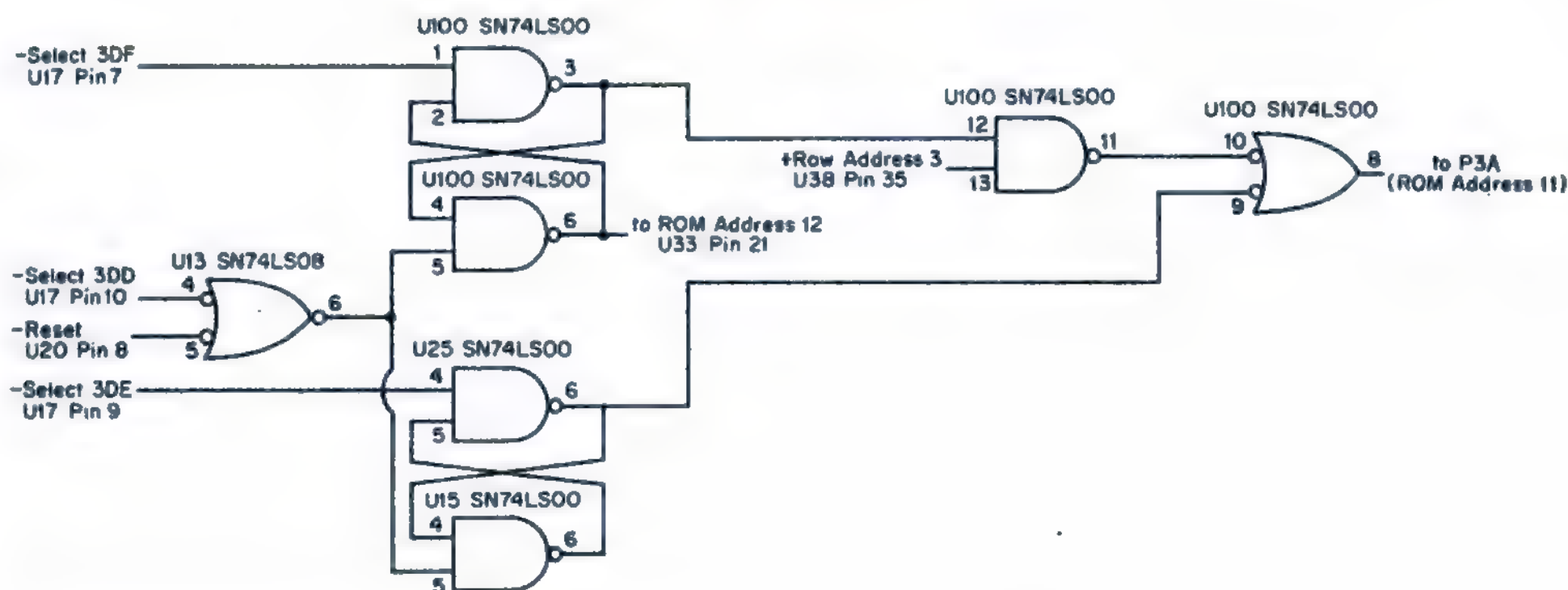


Figure 7: A schematic diagram of the added circuitry.

corresponds to 25 rows of 8 scan lines, for example. When 9 scan lines are used, there is easily room for 22 rows. The screen can accommodate 24 rows if you take care to center the displayed lines on the CRT so nothing gets cut off at the corners. The 24-line solution is desirable. Almost every BASIC program will run without modification if only 24 lines are displayed, because the 25th line is usually reserved for key definitions. To display character rows with an extra scan line, only a software change is needed to mod-

ify these registers in the MC6845:

Register Number	Register Name	New Hex Value	New Dec Value
4	Vertical Total	1C	28
5	Vertical Total Adjust	01	01
6	Vertical Displayed	18	24
7	Vertical Sync Position	1A	26
9	Max Scan Line Address	08	08

The values in the table will display 24 rows of 9 scan lines; Figures 9 and 10 also show the values you can use if you want to display 22 rows. To load the MC6845, you can use either of the two techniques employed in the previous project. You can load the MC6845 registers directly from a program, or you can create a new parameter table for the BIOS to use. The first method is a little easier to introduce into a program, but the second is more persistent. Switching in and out of graphics mode with a new parameter table will not cause reversion to the eight-line character box. Figure 9 shows how you might reload the MC6845 as part of a BASIC program; Figure 10 shows how you might "install" a parameter table of values for the text modes.

If the MC6845 is reprogrammed without the accompanying hardware modification, nine lines will be displayed for each character. However, the ninth line is not blank: it's the first line, line 0, again. Try it—just enter the program in Figure 9 and run it.

You need to make sure that nothing is displayed during the ninth line interval. There are two parts to this problem: detect-

```

UPPER CASE TEXT-ABCDEFGHIJKLMNO P Q
lower case text-abcdefghijklmnopq
descenders-gjpqygj pqygj pqygj pqygj
UPPER CASE TEXT-THE QUICK BROWN F
    
```

```

UPPER CASE TEXT-ABCDEFGHIJKLMNO P Q
lower case text-abcdefghijklmnopq
descenders-gjpqygj pqygj pqygj pqygj
UPPER CASE TEXT-THE QUICK BROWN F
    
```

Figure 8: Characters in an 8 × 8 and a 9 × 9 box.

ing when the ninth scan line is occurring, and inhibiting character display at that time.

Several MC6845 outputs, Row Addresses 0 to 4, indicate which scan line of a character row is currently displayed. Since the color/graphics card usually displays only eight lines, only Row Addresses 0 to 2 are used; they take on all binary values between 000 and 111. Row Addresses 3 and 4 are not connected to anything and are always valued at 0. That's why the ninth scan line looks like the first: the value 1000 appears as 0000 when only the three lowest bits are observed. Therefore, Row Address 3 may be used to detect when the ninth scan line is occurring.

The second part, inhibiting character

display, is easy, too. An unused input to the logic circuitry makes the screen dots at U22, pin 9. It is connected to the +5 volt power supply, which serves as a logical 1. If it is connected to 0 volts, no dots will be drawn.

The only problem is that Row Address 3 is true (+5 volts) when we want it to be false (0 volts) to inhibit the display, and vice versa. Fortunately, circuits that invert logic signals can solve this problem. An unused NOR on the color/graphics card can be used in this way.

Connections

If you have not made the third-font modification to the color/graphics card described in the previous project, making

this change is easy:

1. Cut the printed-circuit card trace connecting U22, pin 9 to the +5 volt power supply. The trace is about a 1/4-inch long and 1/8-inch wide, much wider than most of the traces. It runs horizontally on the component side of the card from U22, pin 9 toward the black metal card-mounting tab. Carefully cut between the two plated-through holes on it to open the circuit. Use a single-edge razor blade or a craft knife. Make several scores to open a good gap. Be sure not to damage the thin traces on either side of the wide trace.
2. Connect U38, pin 35 (+RA3) to U65, pins 11 and 12 (inputs to spare

```

10 '24ROWS.BAS--Program to modify paramaters in BASIC and for the Color/Graphics
    Card
20 'Copyright (C) 1984 Laurence V. Marks
30 DEF SEG=0 ' Switch to Color/Graphics adapter if both installed
40 POKE 1040,(PEEK(1040) AND &HCF ) OR &H20
50 SCREEN 1 ' The sequence SCREEN 1 : SCREEN 0 causes the standard parameters
60 SCREEN 0 ' to be loaded into the MC6845
70 INPUT"Width (40 or 80)? ",W:WIDTH W
80 LOCATE ,,1,6,7 ' Standard cursor for Color/Graphics display
90 FOR I=1 TO 4:READ A$:PRINT A$;:PRINT A$;:NEXT I
100 PRINT "Strike any key when ready . . ."
110 A$=INPUT$(1)
120 '=====
130 ' The 9 x 8 box setup starts here
140 '=====
150 OUT 980,4:OUT 981,28 ' Vertical Total
160 OUT 980,5:OUT 981,1 ' Vertical Total Adjust
170 OUT 980,6:OUT 981,24 ' Vertical Displayed {22}*
180 OUT 980,7:OUT 981,26 ' Vertical Sync Position {25}*
190 OUT 980,9:OUT 981,8 ' Max Scan Line Address
200 '=====
210 ' The 9 x 8 box setup ends here
220 '=====
230 DEF SEG
240 POKE 92,24 ' Tell BASIC there are 24 lines (default condition) {22}*
250 ' For a 22 line display, substitute the values in braces { }
260 RESTORE
270 DATA The quick brown fox jumped over the lazy
290 DATA DOGS. THE QUICK BROWN FOX JUMPED OVER T
310 DATA DESCENDERS-gjqpygjqpygjqpygjqpygjqpygjqp
330 DATA CAPS-ABCDEFGHIJKLMNPOQRSTUVWXYZABCDEFGHI
340 '
350 '

```

Figure 9: A BASIC program to reload the MC6845 registers for adding a blank line.

Meet Max.



For the first time ever,
a professional, reliable, removable disk drive. Thanks, Mom.

MOM knows a good drive when she sees one. And Max Drive™ is the best mass storage disk system yet for IBM PCs, XTs, and IBM-compatibles. Apples, too. With infinite capacity for storage, one removable 10-megabyte cartridge at a time.

MAX PUTS 10 MB IN THE PALM OF YOUR HAND.

The trouble with fixed hard disk systems (and we mean all of them) is that they have just so much storage capacity

built in. And when it's full, it's time to buy another system.

Not Max. His capacity for storage never ends. You can slip 10 mb in, one right after the other. Ad infinitum. That means you—or anyone else—can keep your own information on your own cartridge. And take it along when you're finished. No more crowded storage on single disks. A lot more security.

BACK-UP? MAX GOES FULL SPEED AHEAD.

You can copy 10 mb of hard disk information onto one Max cartridge in about 3 minutes. Without Max, it takes 40-60 diskettes and nearly a whole day. Reformatting is something else. Max takes 4 ½ minutes. Your hard disk takes 4 ½ hours. (Yawn.)

MAX DRIVES A HARD BARGAIN.

Byte for byte, you cannot find more storage for the price than Max. For that

matter, you can't find anything else quite like Max on the market today.

Max comes in both single (10 mb) and dual (20 mb) disk drive units. Give MOM a call today and ask for a test drive. Dial 1-800-241-1170 or 404-351-2902.

Remember,
MOM knows best.



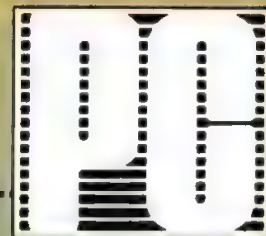
MOM™

Specialists in Marketing of Micros to Mainframes

26



REASONS TO SUBSCRIBE TO



...because PC goes on-sale every-other-Tuesday, bringing you the latest innovations and applications as they happen!

When you subscribe to PC, you'll receive the most up-to-date facts and technological breakthroughs that affect your PC, every-other-week! YES! PC will be delivered to your door at unbelievable savings!

You'll begin to develop a library of professional insights including the latest coverage of newly released hardware and peripherals. You'll find timely information on innovations in programming, applications and networking. You'll communicate with professional users like yourself and get reviews of new software packages, some before they even hit the shelves!

You can subscribe to PC, The Independent Guide to IBM Personal Computers for as little as \$1.00 an issue! Use the attached coupon at right TO SUBSCRIBE TODAY!

GET THE MOST UP-TO-DATE INFORMATION FOR YOU AND YOUR PC EVERY-OTHER-WEEK, WITH PC!

26 **SUBSCRIBE TO**

P.O. BOX 2443 • BOULDER, CO 80322

PC42009

YES, Please enter my subscription to PC for:

☐ 20 issues for \$21.97 LESS THAN \$1.10 A COPY!

☐ 40 issues for \$39.97 LESS THAN \$1.00 A COPY!

Full one-year subscription price \$34.97. Single copy price \$2.50.

Mr./Mrs./Ms. _____
please print name in full

Company _____

Address _____

City _____ State _____ Zip _____

Check one: ☐ Payment enclosed ☐ Bill me later

Charge my: ☐ American Express ☐ Visa ☐ MasterCard

Card No. _____ Exp. Date _____

Add \$2 per issue for postage to Canada and all other foreign countries. Please allow 30 to 60 days for delivery of first issue.

READABLE SCREEN

```

;
TITLE  Install Video Params and Set Pointer at
Int 1DH
; Copyright (C) 1984 Laurence V. Marks
PAGE   60,96
NAME   Ninehi
ONESEG  SEGMENT
        ASSUME CS:ONESEG
        ORG   100H
HERE    PROC  FAR
        JMP    SHORT  START
;=====
;      CONSTANTS AREA
;=====
0102    INT_RET LABEL  BYTE
= 0025  DOS_FUNCT      EQU    25H
= 001D  INT_VECTOR     EQU    1DH
= 0074  INT_OFFSET     EQU    INT_VECTOR * 4
= 0076  INT_SEGMENT    EQU    (INT_VECTOR * 4) + 2
= 0410  EQUIP_FLAG     EQU    410H
= 0000  SET_MODE        EQU    0H
= 00DF  CRT_TYPE        EQU    0DFH      ; 80 Column monitor
= 0000  MODE_SELECT     EQU    0H      ; 40 x 25 black and white
; Could substitute 1H      40 x 25 color
; or                      2H      80 x 25 black and white
; or                      3H      80 x 25 color
;=====
;      VIDEO PARAMS TABLE
;=====
0102    VIDEO_PARAMS LABEL BYTE
0102    38 2B          DB    38H,2BH ; MODIFIED TABLE FOR 40 x 25 DISPLAY
0104    2D              DB    2DH    ; Horizontal Sync Position
                                ; Could be 2C or 2B to shift display
                                ; slightly to the right. See the text.

0105    0A              DB    0AH
0106    1C              DB    1CH    ; Vertical Total (28 rows of chars)+1
0107    01              DB    01H    ; Vertical Total Adjust (1 scan line)
0108    1B              DB    1BH    ; Vertical Displayed (24 rows of chars)
                                ; Use 16H for 22 row option
0109    1A              DB    1AH    ; Vertical Sync Pos (26 rows of chars)
                                ; Use 19H for 22 row option

010A    02              DB    02H
010B    0B              DB    0BH    ; Max Scan Line Adr(8 lines per char)+1
010C    06              DB    06H    ; Cursor Start (Line 11)
010D    07              DB    07H    ; Cursor Start (Line 12)
010E    00 00 00 00     DB    0,0,0,0
0112    71 50           DB    71H,50H ; MODIFIED TABLE FOR 80 x 25 DISPLAY
0114    5A              DB    5AH    ; Horizontal Sync Position
                                ; Could be 56 - 59 to shift display
                                ; slightly to the right. See the text.

0115    0A              DB    0AH
0116    1C              DB    1CH    ; Vertical Total (28 rows of chars)+1
0117    01              DB    01H    ; Vertical Total Adjust (1 scan line)
0118    1B              DB    1BH    ; Vertical Displayed (24 rows of chars)
                                ; Use 16H for 22 row option

```

Figure 10: IBM Macro Assembler program to replace the default MC6845 parameters to add a blank line.

```

0119 1A          DB      1AH      ; Vertical Sync Pos (26 rows of chars)
                                ; Use 19H for 22 row option
011A 02          DB      02H
011B 08          DB      08H      ; Max Scan Line Adr(8 lines per char)+1
011C 06          DB      06H      ; Cursor Start (Line 11)
011D 07          DB      07H      ; Cursor Start (Line 12)
011E 00 00 00 00 DB      0,0,0,0
                                ; UNMODIFIED GRAPHICS TABLE
0122 38 28 2D 0A 7F 06 DB      38H,28H,2DH,0AH,7FH,6,64H,70H,2,1,6,7
      64 70 02 01 06 07
012E 00 00 00 00 DB      0,0,0,0
                                ; UNMODIFIED 80 x 25 TABLE
0132 61 50 52 0F 19 06 DB      61H,50H,52H,0FH,19H,6,19H,19H,2,0DH,0BH,0CH
      19 19 02 0D 0B 0C
013E 00 00 00 00 DB      0,0,0,0
= 0040          TABLE_LENGTH EQU      $-VIDEO_PARMS
                                ;=====
                                ; Everything after here is not kept resident in memory ;
                                ;=====
                                ASSUME CS:ONESEG,DS:ONESEG,SS:ONESEG
0142          START:
                                ;=====
                                ; Set up for return to DOS ;
                                ;=====
                                PUSH     DS
                                XOR      AX,AX
                                PUSH     AX
                                ;=====
                                ; Relocate the Video Params Table into the PSP. ;
                                ; That is, copy it over, 256 bytes earlier in memory. ;
                                ; This will avoid reserving 256 bytes of wasted memory ;
                                ; ahead of the table. ;
                                ;=====
                                CLD
                                MOV      CX,TABLE_LENGTH
                                MOV      AX,ES
                                SUB      AX,100H
                                MOV      ES,AX
                                XOR      DI,DI
                                MOV      SI,OFFSET VIDEO_PARMS
                                REP      MOVSB
                                ;=====
                                ; New Interrupt ;
                                ;=====
                                PUSH     ES
                                POP      DS
                                XOR      DX,DX
                                MOV      AX,DOS_FUNC * 256 + INT_VECTOR
                                INT      21H
                                ;=====
                                ; Set Color Mode and... ;
                                ; Do a Video Interrupt to assure the parms are read ;
                                ;=====
                                XOR      AX,AX
                                MOV      ES,AX

```

(Figure 10 continues)

READABLE SCREEN

(Figure 10 continued)

```
0165 26: 80 0E 0410 30
0168 26: 80 26 0410 DF
0171 8B 0000
0174 CD 10
```

```
0176 8A 0040
0179 CD 27
017B CB
017C
017C
```

```
OR      BYTE PTR ES:EQUIP_FLAG,030H      ; Both bits on
AND      BYTE PTR ES:EQUIP_FLAG,CRT_TYPE ; Turn one off
MOV      AX,SET_MODE * 256 + MODE_SELECT
INT      10H                               ; Video Interrupt
;=====
; Other one time code could go here
;=====
; Terminate back to DOS but remain resident
;=====
MOV      DX,TABLE_LENGTH
INT      27H
RET
HERE    ENDP
ONESEG  ENDS
END      HERE
```

(Figure 10 ends)

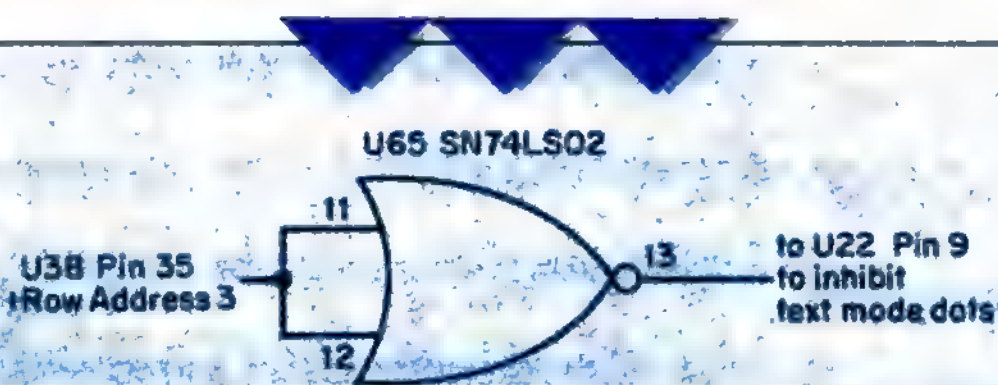


Figure 11: A circuit to inhibit display of the ninth scan line for cards without the third-font modification.

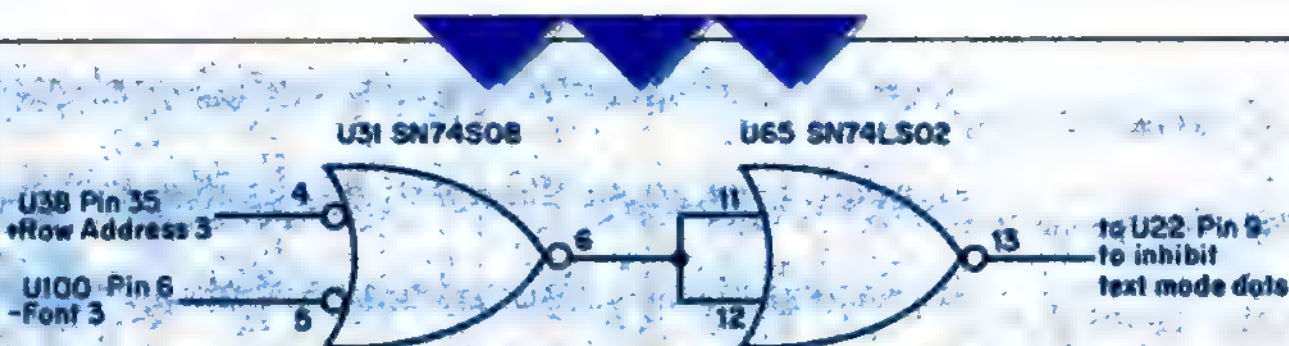


Figure 12: A circuit to inhibit the display of the ninth scan line for cards with the third-font modification.

NOR).

3. Connect U65, pin 13 (–RA3, output of NOR) to U22, pin 9 (inhibits dots). This change works on an unmodified card, or one that has the double-dot/single-dot modification. The circuit is shown in Figure 11.
- If you have installed the third-font

modification, you must work slightly harder. You can't simply turn the dots off whenever the scan line count is greater than 7, because the large font displays 13 lines; you must turn it off only if the large font is not selected. There are enough spare integrated circuit sections to do this. The circuit shown in Figure 12 uses an

AND circuit to inhibit dots if Row Address 3 is active and the third font is not selected. After completing Step 1 of the connection instructions, continue as follows:

2. Connect U38, pin 35 (+RA3) to U31, pin 4 (input to spare AND).
- 2A. Connect U100, pin 6 (–third font) to U31, pin 5 (input to spare AND).
- 2B. Connect U31, pin 6 (output of AND) to U65, pins 11 and 12 (input to NOR).

Then continue with Step 3 as above.

Because the added circuitry works only when the scan line count is greater than 7, and it never does exceed 7 under normal operation, you need not take any special care. To make it active, merely run the code in Figure 10 or insert the code in Figure 9 into any BASIC program in which you desire this feature.

As with the large-font project, this modification is better suited to certain applications than others. Screen-oriented programs that don't scroll the display, such as *PC-File* or *PC-Talk* ought to work just fine. Nearly every BASIC program should run without modification if the 24-line option is selected.

Most editors and word processors that use the 25th row for prompting or key information can be used without modification, if you are aware of the missing prompting information. ■

**Thinking of
buying a modem?
You owe it
to yourself to check out the Qubie' 212A modems.**

Inside Outside

Just a few years ago, computers needed big air-conditioned rooms to operate in, balefuls of money to buy, and a team of wizards to keep them running. The constant march of technological progress has given more and more powerful machines which cost less and less. Desktop computers more powerful than the early mainframe computers are the result of the evolution. The Qubie' modems represent the latest extension of this progress. Because up until now, a 212A compatible modem cost at least \$500. Through the use of four low-cost, state of the art microprocessors, we can now offer two versions of our full featured 212A modem at prices the competition sells 300 baud modems for.

In The Beginning

In September of 1983 we introduced the first 212A modem card for the IBM PC available for under \$300. The PC212A/1200 is a complete communications package including PC-TALK III software, modular phone cable, card edge guide, and instruction manual. The modem is an auto-dial, auto-answer type, which uses all the Hayes software commands so it can be used with any of the popular software packages including Crosstalk™, and Smartcom™. We picked the best software package we could find based on it's ease of use and features, PC-TALK III. Our modem includes features the old industry standard missed out on. Like being able to fit in one slot in a Portable PC or PC/XT.

Or an optional connector to use the modem's serial port when not using the modem. Of course the topper is the \$299 price, hundreds less than the competition.

Now Available Outside

Our standalone modem, the 212E/1200 can be used with any computer or terminal with a RS-232C serial port. You can use any Hayes compatible communications software on anything from an Apple to a Zenith. Many owners of IBM PC's are using it because they lack available expansion slots, or have more than one computer they want to use their modem with.

It's attractive gold anodized case houses seven status lights (who says low prices means a shortage of features). It fits comfortably under a standard telephone. It is also a 212A compatible auto-dial, auto-answer modem which supports all Hayes software commands. Even the switch settings are the same, so any software giving recommended switch settings for a Hayes modem can be used, without knowing what the switches do. There is a volume control knob for easy adjustment of the speaker's output. Included in the package is modular phone cable, a cable to hook it to your computer or terminal, and instruction manual. Choose the communications package right for your needs, and you're ready to go!

Four Hearts

The heart of the Qubie' modems are four digital signal microprocessors. Two handle sending, and two do the receiving. Rather than attempt to filter all but the relevant tones used for modem communications, the

microprocessors measure the tones digitally. This allows them to overcome line noise and static better than analog filter based modems

Why Buy From Qubie'

Because you will get a product as good or better than any available, pay less for it, and get factory direct help if you need it. If at any time during the one year warranty period your modem should require service, we will fix it or replace it within 48 hours. Notice also there are no hidden charges in our prices. No extra for freight, insurance, credit cards, or COD fees. In a hurry? UPS 2nd day air service is just \$5 extra. If you are like many who say, "Nah, it's too good to be true," just apply the acid test and find out. Then you will be asking yourself, "Why should I pay what these modems used to cost?"

The Acid Test

Qubie' gives you a 30 day satisfaction guarantee on your modem. If you are not completely satisfied we will refund the entire amount of your purchase including the postage to return it. If you can, get anyone selling another modem to give you the same guarantee. Buy both, and return the one you don't like. We know which one you will keep.

IBM is a trademark of International Business Machines Corporation. Crosstalk is a registered trademark of M Crosul Inc. PC-Talk III is a registered trademark of The Headlands Press Inc.



PC212A/1200 Includes Modem Card, PC TALK III software, card edge guide, modular phone cable, quick reference card, and instruction manual **\$299**. Optional external serial port connector **\$20**.

212E/1200 Includes Standalone modem with cable (specify male or female), modular phone cable, and instruction manual **\$329**.



Order Today, Shipped Tomorrow!

All prices include UPS surface freight and insurance. Add \$5 for two day air service. For fastest delivery send certified check or credit card. Personal checks take 18 days to clear. Calif. residents add 6% sales tax. Corporations and Institutions call for purchase order details.

(800) 821-4479

Toll Free Outside California

(805) 987-9741

Inside California

QUBIE'

4809 Calle Alto
Camarillo, Ca. 93010

Tempo House, 15 Falcon Road,
London SW11 2PH, United Kingdom

© Copyright Qubie' 1984

CIRCLE 227 ON READER SERVICE CARD

HARDWARE

JOHN HELLIWELL





STM

The 80186-based STM PC is almost PC-compatible, almost portable, and almost fulfills the office-in-a-box ideal.

Brings
Desktop
Power to a
Portable—
Almost

Photograph: Vance Schinger

STM PC

The problem with most truly portable, briefcase-size computers is that they aren't complete enough to be really useful. The problem with most transportable, full-featured, PC-compatible computers is that they aren't really that easy to move around.

Now from an ambitious Canadian company called Semi-Tech Microelectronics Corporation (STM) comes a personal computer that tries to fill the gap between these two poles. The STM PC, which is IBM PC-compatible, has too many features to actually fit into your briefcase, but it's lighter and more compact than other transportables.

The STM PC is based on an Intel 80186 processor and two quadruple-density disk drives. The processor is considerably faster than the one on the IBM PC, and the disk drives are twice as capacious as the PC's. It has a built-in modem, a thermal printer, and the first LCD screen on the market with a full 25 lines by 80 characters. A nice touch is a hands-free telephone with directory and dialing software, which you can use even as you compute. STM is promoting its Personal Computer as an office-in-a-box that fulfills all your needs; the STM PC certainly comes closer to this ideal than any of the machines that are briefcase-size, even than the very expensive Grid Compass.

The machine weighs 17 pounds naked. But in its nylon carrying case, accompanied by two manuals and a roll of thermal paper, the STM PC weighed 26 pounds. It

fits easily under an airline seat, although it's not so light that you'd want to carry it around without good reason.

All in all, it's a machine whose specifications and design promise a lot: I wish it delivered on all its promises.

A Quick Look

STM's design is quite creative. The STM PC is a single unit about the size and shape of a small attache case (20 inches wide, 11 inches deep, 4 inches high). On the right are two half-height floppy disk drives. On the left is a sloped LCD screen. The keyboard fits into a plastic shell that you flip upside down and snap over the screen for transporting. The built-in printer is apparent only as two thin slots, one in the back and one in the top of the computer, through which roll paper passes. When closed up, and with its roll of printer paper and its power cord removed, the STM PC is a clean, rectangular box. Packing it up is easy, although fitting the coiled keyboard cord back into its little compartment is as difficult as refolding a roadmap.

At the back of the machine are a multitude of connectors: two RS-232 serial ports, a telephone miniplug socket, a socket through which an acoustical coupler can be attached to the built-in modem, a parallel printer port, a standard video jack, a color monitor jack, a connector for an expansion chassis (any IBM chassis, apparently, will do, as will IBM-standard cards), and an SCSI (small computer systems interface) connector to which several makes of hard disk can be attached.

Under its hood the STM is tightly packed. It has a couple of small fans, which appeared to operate adequately. The machine is not meant to be probed by the user, a reasonable design principle since it has no internal space for board expansions, except for a slot holding an extra 256K of memory. (Early versions of the STM PC can be upgraded only by replacing their 64K chips with 256K chips.) Expansion boards can be added in an expansion chassis that is connected

through the I/O expansion socket on the back. The STM has no slot for an 80187 coprocessor. Additional detail was difficult to come by, since STM has not yet released a technical manual.

The STM PC portable model sells for \$3,449. A desktop model with only one serial port and without an LCD screen, modem, printer, or telephone costs \$2,499. Both models include STM's version of MS-DOS, and *NewWord*, a word processing program that imitates the popular *WordStar*. (*NewWord* was favorably reviewed in *PC*, Volume 3 Number 15.) BASIC is not included.

Feature by Feature

The 80×25 LCD screen, made by Epson, can display just about everything an IBM PC screen can, although only in regular and reverse video; it has no equivalent to the bright and dim characters available on most CRT screens. The LCD will display standard IBM graphics as well as text (640 by 200 pixels), but because it is proportionately much wider and shorter than a standard screen, your pie charts will come out as egg charts. A knob labeled Contrast lets you adjust the screen for viewing angle, and a backlight makes the screen glow a light-blue color.

The screen's display area is 3¼ by 9¾ inches—large enough for use from a normal working position at a standard desk. However, its smooth, glass front panel seems to find some glare to reflect no matter what angle you view it from. I found that I could read the LCD screen comfortably only by using the backlight in a somewhat darkened room.

Fortunately, either a color or monochrome monitor can be connected easily to the STM PC. Most buyers will probably invest in a simple, standard monitor for the machine's most common resting place and use the LCD screen only when on the road. Of course, a monitor is necessary for any color work.

The keyboard has the same 83 keys as the IBM PC. Their arrangement is more compact, and a few are repositioned. The



STM PC

Semi-Tech Microelectronics
Corporation
390 Steelcase Rd. East
Units 7 & 8
Markham, Ontario
Canada 13R 1G2
(416) 475-2670
List Price: \$3,449

CIRCLE 793 ON READER SERVICE CARD

Enter key is considerably larger than the one on the IBM PC. The ten function keys are across the top of the keyboard, probably a better place for them than the IBM location; however, the placement is an irritating distraction for anyone who must move back and forth between an STM and an IBM PC or any other machine with the PC's layout. The keyboard feel is less crisp but quite satisfactory.

STM has equipped its PC with Canon quadruple-density disk drives, which, in some of its advertising, it claims have a capacity of 2 megabytes. In the fine print, the company acknowledges it is quoting an unformatted capacity, a practice akin to describing a refrigerator in terms of its outside dimensions. The meaningful figure, for floppies as for refrigerators, is inside capacity. STM's formatted, usable capacity is 712K per disk.

The disks are "sort of" IBM-compatible. The STM PC can read IBM disks, so you can copy data from IBM to STM disks. You can load programs into the STM from IBM disks. But the STM cannot write information onto IBM disks, nor can the PC read STM disks. So disk compatibility between the two machines is a one-way street, from IBM to STM. The only way to get information out of an STM PC and into an IBM PC is through a wired communications connection. Because this incompatibility causes it some problems in the marketplace, STM also sells a version with 360K disk capacity.

STM has equipped its PC with an 80186 processor, an advanced version of the 8088 used by the IBM PC. The advantages of the 80186 include greater speed, more circuits on the main chip (which means fewer are needed in the rest of the computer), and a true, full-fledged 16-bit address bus. The disadvantage is that the different chip makes true PC-compatibili-

ty more difficult to achieve.

Whether the processor's speed will be of use to you or not depends on the task you are performing. If the task involves manipulation of data in memory, the STM will perform considerably faster than an IBM PC. However, it doesn't move data from or to disks any faster, so tasks involving heavy disk traffic won't be as significantly speeded up. For example, loading 1-2-3 from disk took each machine 9 seconds; loading a 48K spreadsheet took 23 seconds. But a spreadsheet recalculation that took the IBM PC 6 seconds was done in 3 by the STM PC.

In a long *WordStar* document, proces-

compatible in one brochure, an exaggeration its sober-minded Canadian marketing manager attributes to an overexuberant California ad agency.

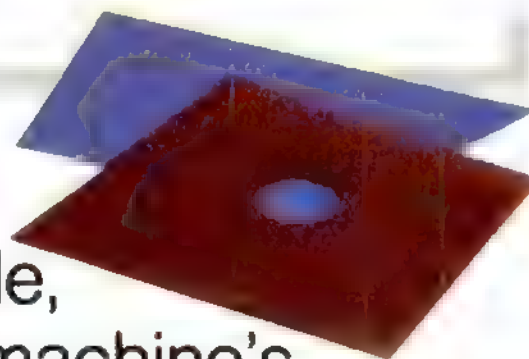
In truth, like the disks, the computer itself is "sort of" IBM-compatible. It will run 1-2-3 directly from an IBM disk. It is reported to run Microsoft's *Flight Simulator*. *WordStar* and *dBASE II* also runs fine.

I had trouble with two different communications programs (*Crosstalk* and *PFS:ACCESS*), neither of which could find the serial port. STM thinks my experience was an anomaly, since the company uses the same program itself without problems.

IBM BASIC won't run on the STM PC. STM was still working on its version of BASIC as of this writing, so it couldn't be tested.

Copy-protected programs cause some problems, depending on the copy-protection scheme. I tested

Most buyers will probably invest in a simple, standard monitor for the machine's most common resting place and use the LCD screen only when on the road.



sor-intensive tasks took anywhere from one-and-a-half to two-and-a-half times as long on the IBM PC as on the STM. Scrolling all the way through the document using the cursor key, for example, took the IBM PC 47 seconds, the STM 28 seconds. Completely reformatting the text to different margins took the PC 1 minute, 47 seconds, the STM a flat 47 seconds. The speed is constantly apparent in the brisk responsiveness of the cursor and the near-instant regeneration of the screen when you move about the document.

Accompanying the fast processor is a standard 256K of RAM, expandable to 512K for \$500. The 256K is not quite as usable as 256K on an IBM PC because 38K is occupied by special STM device drivers and other housekeepers, leaving 218K of usable memory.

STM claims its PC is IBM-compatible—it goes as far as to say "totally"

three programs on the STM that use variations of the you-have-to-leave-the-original-disk-in-the-A:-drive scheme. One of them (*PFS:ACCESS*) loaded with no trouble; two of them (*Concentric Information Processor* and *The Spreadsheet Auditor*) refused to load. *Concentric* raises another problem: while the program is running, it writes some configuration files onto its uncopyable program disk. Consequently, *Concentric* couldn't be run on an STM (the double-density version, at least) because the computer can't write to IBM-format diskettes.

STM admits that copy-protected software is a problem, especially since the variety of schemes is great and growing. The company says it will make the necessary modifications to its operating system as the problems are drawn to its attention, a generous and ambitious promise, but not a completely satisfactory answer to the

customer who wants to run a particular program right away.

These problems aside, STM has engineered a system that runs an impressive array of IBM software even though it uses a different processor. And besides standard computer features, STM has thrown in a number of interesting and useful extras. Unfortunately, none of them quite lives up to its promise.

A thermal printer is handy while away from home. It prints on a 4-inch-wide roll of that nasty, tacky paper that discolors in your files, but for a quick printout, you'd think it should be fine. However, the printer can only be driven by the DOS PRINT command or by the PrtSc key. You cannot use it as an ordinary printer driven in the normal way from a program. For a program such as *WordStar*, which lacks a proper print-to-disk feature, using the STM built-in printer is a real problem.

In principle, the DOS PRINT program should be able to run in the background; you should be able to load another program and use it while the printing is going on. In fact, STM's DOS allows you to load the other program, but doing so brings printing to a halt; the printer resumes when you exit back to DOS.

Unfortunately, the printer is so slow that background printing is essential. A page-long file took nearly 5 minutes to print.

The printer normally prints a 40-character line. It can print 80-character material as well, but only sideways, in 24-line chunks. Happy gluing! Sideways printing completely freezes the computer and takes even longer than 40-character printing—more than 10 minutes for a one-page file and 3 minutes for a screen dump. STM could have made its thermal printer more useful by buffering it, allowing the printer to proceed in the background while the computer moved on.

STM has built in a modem, which some of its advertising calls a 300/1200-baud modem. But the modems on early machines (including our test machine) operated with the rarely used Bell 202

communications standard for 1200 baud. To be useful, a 1200-baud modem must use the Bell 212A standard, so for all practical purposes, the early versions had only a 300-baud modem. These early modems could only use STM's own communications program, a modest offering.

However, STM promises that, by the time this article is published, its machines will have a Hayes-compatible, honest-to-goodness 300/1200-baud modem that will work with the popular communications program. If you buy, be sure your dealer doesn't have old stock.

A built-in, hands-free telephone is a terrific idea. You can make or answer a call any time while using the computer. After you hit a couple of control keys, your computing is frozen and your person-

STM could have made its thermal printer more useful by buffering it.

al phone dialing directory appears. Select a name and the computer dials for you. You can speak to a colleague without picking up your phone, then hang up and return to your computing exactly where you left off. Unlike other telephone-dialing programs, this one does not require you to put away your work to dial the phone, so it could be truly useful.

I have two caveats. First, STM's hands-free phone is even worse, acoustically, than many others of that odious species. You might get away with using it to automatically dial and then get the receptionist to your colleague, but don't plan to use it to actually converse with anyone whose continued esteem you value. Second, the controlling software is imperfect. I found that if I activated the phone software while the program was performing a disk operation (loading a file into *WordStar* or 1-2-3, say, or formatting a disk),

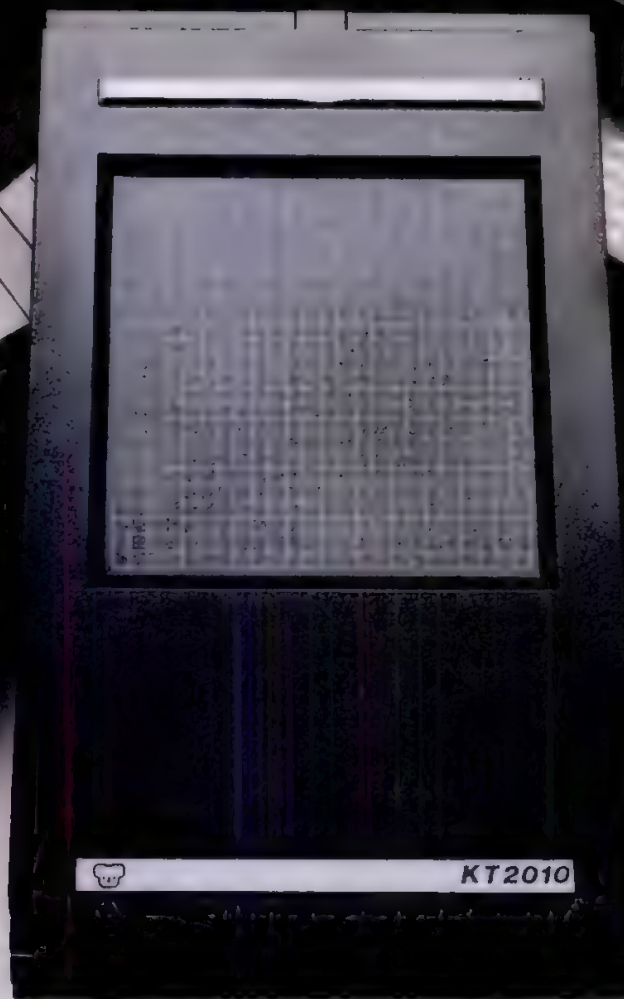
the computer completely stalled when I returned from the telephoning software and required a system reset.

Unfortunately, the instability of software associated with STM's version of MS-DOS is not limited to the telephone controlling program. Frequently, on the test machine I had, the booting process would stall before completion and would not respond to the Ctrl-Alt-Del reboot command; the machine had to be turned off and on, or reset. A number of similar problems seemed to be associated with the printer and serial ports.

STM's PC is the direct descendent of its first product, an 8-bit computer called (for no obvious reason) the Pied Piper. The Pied Piper was the same shape as the STM PC, which made it interesting and innovative. It had a 720K disk drive, an even more unusual feature a year ago than it is today. It had a built-in modem. It was even more portable, in that it had a carrying handle. It looked good. But when you thought about it for a while, you got to wondering—maybe its drive held 720K, but STM only gave you one of them. It was portable, but it had no screen: you had to hook it up to a television (which the software didn't support very well) or to a monitor. The keyboard wasn't detachable; it was on the main unit, where the new machine's screen is.

When STM's PC came along, you could tell at a glance that STM had learned a lot from the Pied Piper. The new machine has two drives, a detachable keyboard, the biggest LCD screen on the block, and a raft of interesting features—and IBM-compatibility to boot.

Now that I've worked with it, though, I feel a bit sad. Such great potential, a really classy design—and just enough flaws that I don't believe I can recommend it at this point. If you think the machine sounds interesting, however, keep an eye on it. By the time this article is published, some of the faults should have been corrected. The difference between the Pied Piper and the STM PC does show the company is capable of learning from its mistakes. ■



The Shortcut to Business Productivity

Touch and Go

Tired of typing in long computer commands? Let the Speed Key System take control. The Speed Key System consists of the KT 2010 touch tablet, Speed Key Software, and nine pre-configured overlays for Lotus 1-2-3™, WordStar®, Visicalc®, pfs:write®, SuperCalc®, MultiPlan™, dBase II™, DOS® and Basic®. By placing an overlay on your touch tablet, Speed Key can reduce as many as 80 keystrokes to a single push-button command. Now you can delete and insert paragraphs, or leap across spreadsheets in a single stroke.

How to Make A Good Program Great

With Speed Key, you can reprogram keys to fit your individual needs or create your own custom overlays for almost any of the hundreds of IBM PC-DOS programs.

But There's More...

In cursor mode, Speed Key moves the cursor on the screen as you move your finger along the surface of the touch tablet. And you don't need any more desktop space than the tablet itself, about half the size of an 8½ x 11 notepad.

Visit your Local Computer Dealer


Take a look at the Speed Key System which includes • Speed Key Software • KT 2010 Touch Tablet • Speed Key Owners Manual • 9 Pre-Configured Tablet Overlays • Blank Overlays. Or call us toll free, 800-KOA-BEAR.



Koala Technologies™
3100 Patrick Henry Drive
Santa Clara, CA 95052-8100

CIRCLE 172 ON READER SERVICE CARD





Sizing Up The BASIC FOUR

The MAI General Accounting series, a PC reincarnation of Basic Four's successful minicomputer software, is a powerful set of no-nonsense applications. Here we review the first four of the series.

MAI/BASIC FOUR

MAI/Basic Four Business Products Corporation, long known for its Basic Four minicomputer hardware and software line, recently introduced a family of accounting applications for the IBM PC and XT. When the MAI General Accounting Series is complete, it will comprise 11 integrated applications. Four of them—*General Ledger*, *Accounts Payable*, *Accounts Receivable*, and *Inventory*—make up the core of the series and were released earlier this year. The complete portfolio will also include applications for order entry, payroll, purchase orders, sales analysis, financial statements, fixed assets, and a report writer. These packages are, in effect, a scaled-down and made-more-friendly version of Basic Four's successful minicomputer accounting software. They benefit from their minicomputer legacy—their clarity, thoughtful approach, and feature set are truly impressive.

Although MAI's series focuses on the needs of a wholesale distribution business, some of the individual programs are not so specialized and could satisfy the accounting requirements of a variety of businesses. We reviewed the four core systems of the series—the *General Ledger*, *Accounts Payable*, *Accounts Receivable*, and *Inventory* systems.



MAI General Accounting Software MAI/Basic Four Business Products Corporation

601 San Pedro, N.E.
Albuquerque, NM 87108
(505) 266-5811

List Price: *General Ledger*, *Accounts Receivable*, *Accounts Payable*, and *Inventory* packages, \$695 each.

Requires: 128K RAM, DOS 2.0 or 2.1, 80-column display, 132-column printer (or 80-column printer with compressed print), two 360K disk drives.

CIRCLE 790 ON READER SERVICE CARD

The General Ledger

You can learn a great deal about a financial reporting system by examining the size and structure of its chart of accounts. MAI's *General Ledger* has a very flexible account-coding structure—you can choose a format with as many as nine characters in up to four distinct segments. For example, the following represent possible account codes:

1001 Cash
1001-001-110 Cash-Division
 1-Dept 110
400-HDWR Sales-Hardware

For each segment, you must specify whether or not alphabetic characters are permissible, and you can supply an account description of up to 35 characters. This scheme makes for a very versatile financial reporting system.

MAI has also chosen an unusual approach to packaging its software. The company plans to market *Financial Statements* (which was released too late for this review) as a separate package that will allow you to tap the versatility inherent in the *General Ledger*. Without *Financial Statements*, you have to live with the limited set of standard reports that arrives with the *General Ledger*, which includes a chart of accounts listing, listings of your journal entries (with special listings of the recurring and allocation journals you've established), a daily and monthly summary of postings to the general ledger, a trial balance, and a balance sheet and income statement. A working trial balance (a listing of each account with its current balance) is also included. It is formatted so that you can use it as a handy means of "working up" any necessary period-end adjustments. The income statement lists the monthly and year-to-date amounts, with percentages of each line item calculated with total revenue (100 percent) as a basis.

According to MAI, the *Financial Statements* package offers substantial power for creating custom reports from *General Ledger* data (actuals, budgets,

and last year's actuals, basically). The flexibility you'll have will, of course, depend heavily upon how you structure your chart of accounts coding scheme, so you should think this through carefully before setting up your records.

One special feature of MAI's *General Ledger* is the allocating journal entries function. As illustrated in Figure 1, this function lets you establish a series of standard journal entries that will be booked each time you run the end-of-period processing functions. This is different than a recurring or standard journal entry, which is also accommodated by the *General Ledger*. In setting up allocation entries, you establish source and destination accounts. The source account will be cleared (made zero). You determine (by entering percentages) how much of the amount cleared from the source account is to be allocated to each destination account, though you need not allocate the entire balance. This can be very handy if you need to do a number of allocations each period.

You can establish your own accounting calendar with the accounting period maintenance function. For each period (1 through 12), you simply enter the period-ending date. Then, as accounting transactions are processed, the *General Ledger* will record transactions in the appropriate period.

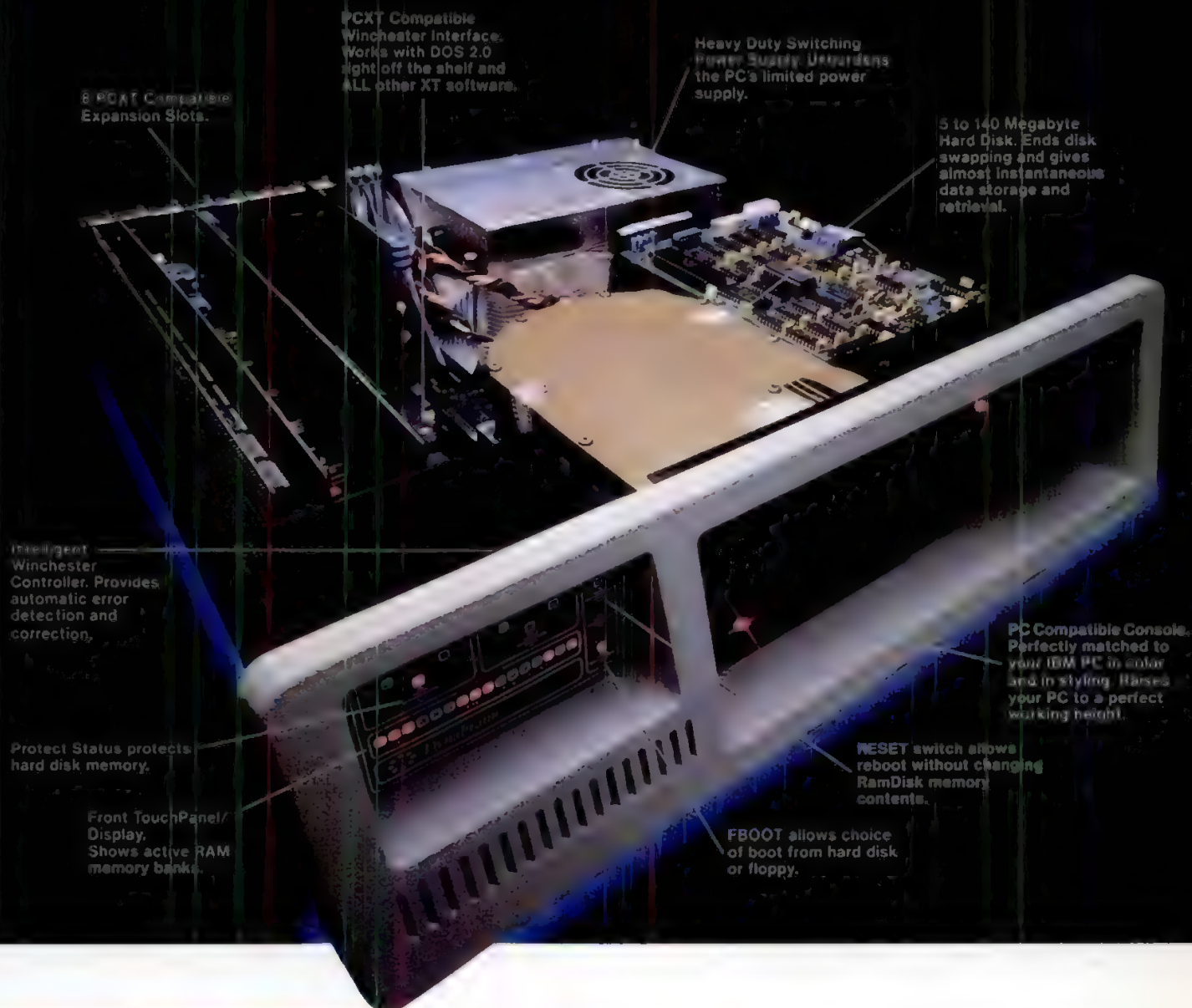
Accounts Payable

The MAI *Accounts Payable* system can operate as a standalone subledger package or can interface with MAI's *General Ledger* and/or *Purchase Order* systems. Like the other MAI packages, the functions are neatly divided into three groupings: Definition, Operations, and Maintenance.

"Definition" includes those routines that allow you to customize your implementation of the package. "Operation" covers day-to-day use of the system, and "Maintenance" provides housekeeping routines that allow you to maintain diskette labels and back up your files.

In defining the system, you can specify

■ D Y N A F R A M E ■



**Turn Your
PC Into
an XT+!**

DynaFrame is a combination of a hard disk drive with your choice of storage capacity (from 5 to 140 Megabytes ... 8 PCXT compatible expansion slots ... high speed backup and added control through the Front

Touch Panel/Display. And, unlike many other sub-systems, DynaFrame is totally compatible with IBM XT software ... no software patching is needed!

You have your choice of several back-up systems. Select from a 5 or 10 megabyte removable hard disk drive ... a high density floppy disk drive ... or a 25 megabyte streamer tape.

See the new DynaFrame at your local computer specialist or write for detailed information.

IBM PC and IBM XT are trademarks of International Business Machines. DynaFrame is a trademark of Vista Computer Co., Inc.

Vista COMPUTER COMPANY, INC.

1317 E. Edinger Avenue, Santa Ana, CA 92705
(714) 953-0523

Announcing
the sudden obsolescence
of the floppy disk.

NEW **HELIX PC BUBBLE DISK™**

HALF-MEGABYTE MEMORY BOARD

The first bubble memory board for
IBM PC/XT and compatible computers.

- NON-VOLATILE: You don't lose data when there is no power.
- Eight times faster than a floppy disk.
- For fixed or portable use without need for back-up storage.
- Impervious to dust, dirt, humidity, cold—as reliable in the North Sea, the Sahara, a Space Station, as in your office.
- Mean time between failure (MTBF) more than 20 years.
- Rugged enough to withstand vibration and shock up to 200Gs.
- For complete details, contact HELIX

See us at Booth R8027
COMDEX™/Fall '84
November 14-18, 1984
Riviera Hotel
Las Vegas, Nevada



Helix Laboratories, Inc.
8123 Remmet Ave., Canoga Park, CA 91304
(818) 710-0300—outside California, 800-468-0004
Dealer Inquiries Welcome

© 1984, Helix Laboratories, Inc.



LET'S TALK EXPERT-TO-EXPERT

PC TECH JOURNAL, the magazine written for sophisticated IBM PC users...talks with you expert to expert!

Do you require a magazine that provides you with the insight and knowledge to act as your silent partner when designing new systems? Have you needed to consult with authorities in telecommunications to resolve a nagging problem? Wouldn't a second opinion about connecting your PC to a main-frame be helpful? With your subscription to PC TECH JOURNAL, you're harnessing experts in your field...experts who will talk to you in the language you understand, about the concerns you have...EXPERT TO EXPERT!

PC TECH JOURNAL is the technologically sophisticated magazine written for experts in the field of personal computing like yourself...discussing the concerns experts have...developing elegant programming methodologies only experts can understand...covering the whole field of IBM PC's with thought-provoking articles on communications, distributed processing, office automation, networking and programming.

Subscribe today and save up to 27% off the full subscription price, and have PC TECH JOURNAL delivered to your home or office every month! From One Expert to Another: *Subscribe Today!*

**TECH
JOURNAL**

P.O. Box 2966, Boulder, Colorado 80322

YES, I want to communicate with other experts and professionals about IBM PC's and compatible machines! Please enter my subscription to PC TECH JOURNAL for:

☐ 9 issues
for \$19.97—
SAVE 11%!

☐ 12 issues
for \$24.97—
SAVE 17%!

☐ 24 issues
for \$43.97—
SAVE 27%!

Mr./Mrs./Ms. _____
please print name in full

Company _____

Address _____

City _____ State _____ Zip _____

Savings based on full one-year (12 issues) subscription price of \$29.97.

Check one: ☐ Payment enclosed. ☐ Bill me later.

Charge my: ☐ American Express ☐ Visa ☐ MasterCard

Card No. _____ Exp. Date _____

Add \$12 a year in Canada and all other foreign countries. Please allow 30 to 60 days for delivery of first issue

PT8Z086

At two o'clock in the morning, when most of the country's asleep, and the phone rates have gone down, my computer is talking to our offices all over the country ... all by itself.

With Transporter, my computer can send and receive files — anything from documents to BASIC programs to VisiCalc reports — late at night, after I've gone home for the day, and after long distance rates have gone down. That saves me time and money.

It does all that without anyone here to help it. I just make up a list of things for it to do, and go home. Transporter does all the rest. It "wakes up" at the appropriate time, dials up other CROSSTALK or TRANSPORTER systems, and transfers the files I want. It can even dial up a remote printer, and print files for me. And it does it all with complete accuracy. When I come in the next morning, Transporter gives me a report of what it did, and at what time it did it.

I like it because it frees up my time during the day. The boss likes it because it saves on our phone bill. (The cleaning ladies are still trying to figure it out.)

Transporter — an exciting new idea in microcomputer communications from Microstuf, the creators of CROSSTALK. Ask your local dealer about it.

MICROSTUF[®]

1000 Holcomb Woods Parkway / Roswell, Georgia 30076

For the IBM personal computer. Requires 96K RAM, two disk drives, PC-DOS, Hayes Microcomputer Products Stack Smartmodem or Smartmodem 1200, IBM Asynchronous communications interface, or equivalent RS232 interface. Communicates with any system running CROSSTALK, TRANSPORTER, or other compatible programs.

Transporter, Crosstalk and Microstuf are Trademarks of Microstuf, Inc. VisiCalc is a Trademark of VisiCorp. Stack Smartmodem and Smartmodem 1200 are Trademarks of Hayes Microcomputer Products, Inc.



TRANSPORTERTM

CIRCLE 326 ON READER SERVICE CARD

MAI/BASIC FOUR

WORLDWIDE ENTERPRISES ALLOCATING JOURNAL ENTRIES

DATE: 06/10/83

REFERENCE: AJE1
DESCRIPTION: RENT - WAREHOUSE & SALES
TRANS CODE: JE
ALLOC B/L ACCT: 520 Rent Expense

DIST	B/L NO	DESCRIPTION	PERCENTAGE	BALANCE:	.00%
521		Rent - Warehouse	85.00		
522		Rent - Sales and Administratio	15.00		

IS THE B/L DISTRIBUTION CORRECT? (Y-N-DELETE)

Figure 1: This screen is used to establish allocating journal entries.

that a "retention field" be available while recording invoices. This lets you retain a portion of each vendor's payment until a decision is made to pay it. So, for instance, you can withhold a portion of a payment until certain conditions, such as the completion of a given task or delivery of a piece of equipment, are met. This is a very common practice in the construction industry.

If you use the cash basis method of accounting, you can still make use of MAI's *Accounts Payable* system for check printing and general ledger distribution. The system will hold all invoices in a temporary file until payment is made. No posting to the general ledger occurs until each payment is made in full.

The *Accounts Payable* system supports the use of up to 24 bank accounts. Bank accounts are assigned alphabetic codes, which are used to mark the checks you write and to assign them to the correct bank and general ledger accounts. When you perform check reconciliations each month (as described below), your checks will be sorted by bank based on these codes.

You can establish a variety of "terms" codes for recording payment terms when entering invoices. Each terms arrangement (for example, 2% 10, net 30) is given

With MAI's
Accounts Payable
system, you can
withhold a portion
of a payment until
certain conditions
are met.

en a unique two-character code. Using these codes, you can specify the number of days until an invoice is due, the number of days in the discount period, and the discount percentage allowed.

Operation of the *Accounts Payable* system begins with vendor master-file maintenance. You assign a code of up to six alphanumeric characters to each vendor. If you choose to segregate the reporting of

accounts payable transactions by division, the first two characters must be used to designate the division. Although this may increase the number of vendors' accounts you have to maintain, it will allow you to report payables and expenditure amounts separately for different divisions. An eight-character sort key is available, which defaults to the first eight characters in the vendor's name. Further, in setting up each vendor, you can specify a two-digit pay cycle number. The pay cycle—a number between 1 and 31—can then be used to determine on which day disbursements are made to each vendor.

Processing invoices and checks that have been written manually is straightforward. The update process automatically posts entries to the general ledger. Before updating, invoice information can be edited freely; after updating, you must make changes by adjusting entries. Updating must occur before checks can be written against invoices. Registers for both invoices and manual checks entered can be printed to verify accuracy before updating takes place.

The automatic payment selection facil-

IF "C" IS YOUR LANGUAGE,

LATTICE WINDOW™

From Now On, All Your Applications Could Have Windows!

NEW RELEASE!

Windows are no gimmick. Ask any user of a windowed product.

Windows can bring unrehearsed combinations of data side-by-side for viewing. Windows can overlay new information atop old, yet can restore the old with a keystroke. Windows let the limited space of a screen show many things, not just one thing.

Windows are one of the new software features people have come to expect. And why not? They make using software more convenient, more versatile. But how do you add this technique to your applications without disappearing for several months of R&D?

With Lattice Window, that's how. It's a product we've been waiting months for. One of those rare programming tools

which will change the way you think of program design. Here's how:

Lattice Window takes over all screen management. It is an extensive set of object code functions which you merely call from your C program.

Think of a window as a screen, a screen of flexible size. You can tell Lattice Window to open and close many such virtual screens. Up to 255 at a time, each from 1x1 to 255x255 bytes. Then tell "Window" to display any portion of these virtual screens on the physical screen — as many as fit. Tell "Window" to place them wherever you want, overlapping and overlaying at will.

Windows no longer needed may be closed. Any background area overlaid earlier (which could be corners of

several windows) will pop back to the screen. Think for a moment what a programming job that technique represents.

To your program, the entered window is the *entire* screen — all row and column references are relative to the window no matter its absolute position in the screen. All scrolling occurs only within the active window. The cursor will not leave its boundaries until your program says so. Any screen window may be entered for display, data entry, whatever. Any virtual screen — displayed or not — may be read from or written to by your program.

- You can move a window on the screen.
- You can grow it to display more of the underlying virtual screen. Or shrink it to show less.
- You can control screen attributes (color, blinking, inverse video, etc.) of any window.
- You can direct output to either the monochrome or color board.

It's a formidable product which will add incomparable flair to your next application!

Product Code: S0800
Suggested Price: ~~\$235.00~~

Our Price:
\$235.00

HALO

A Spectacular Graphics Extension to Lattice C

PMATE

The Programmer's Word Processor

Pmate was designed for programmers. We'll wager that you cannot find a programmer who has discovered Pmate and moved on to something else.

Pmate is a full screen editor with ten auxiliary buffers for squirreling away pieces of text until needed. It uses single key commands to move the cursor, or text, or insert or delete, or rescue several thousand characters of deleted text.

It has a format mode for tab setting or wraparound and shaping when it's time to write documentation. Pmate lets you assign chains of commands or strings of text to single keys: one keystroke could set up the entire shell of a new C function, for example.

Pmate has variables, if-then statements, loops. It calculates, and converts decimal to hex to binary and back. You can write compact programs (called "macros") to delete comments, for example, or check syntax, or process long sequences of commands. Macros can alphabetize lists, do row and column math, perform a series of operations on multiple files, even summon other macros.

Put another way, Pmate is a text editor with its own built-in interpretive language. A language you can use to completely customize this text editor to your fancy. Possibly the most artful, ingenious program you have ever seen.

Product Code: S0600
Suggested Retail: ~~\$225.00~~

Our Price:
\$175.00

Halo™ will astound you. It provides a complete library of graphic functions which can be linked with your Lattice programs to create full-color charts, graphs, simulations, even animation.

Over 100 commands are at your disposal, including plot, line, arc, box, circle, plus single commands to produce bar graphs and pie charts. Pattern-fill and dithering commands give your graphics impressive texture and color mixes, rubber-banding draws shapes for interactive users, area moves produce animation, fill and flood commands paint areas. The newest version allows you to define your own world coordinate scheme, divide the screen into "viewports" (windows), and scale graphic figures automatically.

It's a long list of capabilities which make for an extraordinarily powerful product. In fact, Halo is so good that manufacturers of graphics boards and systems are adopting it as a standard graphics language. So it can bridge your application to other systems. CAD-CAM developers, especially, have embraced its device-independent approach for maximal portability.

Halo is a dazzling demonstration of why C has become the language of choice among programming professionals: its function library architecture means you can tremendously enhance your firepower by acquiring libraries of software like Halo with dramatic economy of time and money.

Requires IBM monochrome or color graphics card or equivalents.

Product Code: S0300
Suggested Price: ~~\$200.00~~

Our Price:
\$125.00

PLINK86

Overlay Linkage to Expand

Software is becoming ever more sophisticated, which means more complex programs requiring large chunks of memory. But if you use extra memory, if you count on users to have expanded RAM, you will forego sales to those who do not.

Plink86 is the answer. It takes on the job of shoe-horning large programs into small memory. First, Plink86 acts as an alternative to DOS' Link. For a language like C which encourages design of separately compiled object modules in the Microsoft relocatable format, Plink86 pulls modules together into single compiled programs. But Plink86's overlay power is what has gained it a reputation as a miracle worker. It binds into the compiled program its overlay manager which knows how to swap modules of your large linked program between disk and memory, so that each can temporarily occupy the same memory space.

Unlike other linkers, the overlay manager acts on its own, needing no calls from the source program. Instead, Plink86's straightforward overlay description language allows you to describe your overlay structure in one place in your program — a structure

PC BRAND HAS THE TOOLS

Your Productivity Could Take Off With Our Craftsman™ Line of Precision Tools

C-FOOD SMORGASBORD

A Menu of Difficult to Prepare C Functions

C is a language of function libraries: sturdy routines which your application can effortlessly reference to get the job done. But someone has to write them. It would take months to concoct and perfect the complex and useful servings which have been prepared for you and thoroughly tested in C Food Smorgasbord™.

Decimal Arithmetic: Functions to perform operations on binary-coded decimal (BCD) numbers of up to sixteen significant digits. Includes trigonometric and logarithmic functions, powers, conversions to strings, and much more.

Level 0 I/O Functions: Enable you to perform direct I/O operations for screen, keyboard, printer, and asynchronous port with no dependence on higher I/O functions to minimize memory usage and maximize speed.

IBM™ PC BIOS Interface Access: Allows you to get at the basic I/O services in the ROM BIOS not available through the normal operating system to get and set the video mode, cursor position, color and screen attributes,

keyboard shift, scrolling, printer channel and port status.

TIP, the terminal independence package: Lets you easily move programs to computers with different types of terminals.

There is a basket of delicacies beyond this brief list; a cornucopia to sample, any one of which will save valuable time and pay back far more than C-Food Smorgasbord's overall price.

Product Code: S0200

Suggested Price: ~~\$150.00~~

Our Price:

\$115.00

All products operate on the IBM PC or PC/XT under PC-DOS and require no more than 64K of RAM unless indicated.

Prices, terms and specifications subject to change without notice.

Prices do not include shipping and handling.

You may freely use these products to create software applications for re-sale without additional licenses or royalty payments, provided your applications are not wholly or substantially replications of the products themselves.

Unix™ Bell Laboratories / Lattice C, C-Food Smorgasbord, and Lattice Window™ Lattice Inc. / MS™ Microsoft Inc. / Halo™ Media Cybernetics / IBM™ International Business Machines / Float87™ Microfloat / Panel™ Roundhill Computer Systems Ltd. / Plink86 and Pmate™ Phoenix Software / CP/M-86™ Digital Research

PANEL

Are You Still Coding Hand-Made Data Entry Screens?

Designing custom screens is intricate, time-consuming, and costly. It can make you the loser in competitive bidding. It can add weeks, even months to bringing your product to market.

But not when you use Panel™. Put Panel to work and you hire a superprogrammer for the minimum wage. Telling Panel your screen design is like using a word processor. You can add, move, copy, delete, and reshape fields with single key commands. The result? Finished C program code with field descriptors, color and highlighting, input editing by type of field, help keys, and warning messages.

Panel can also create a terminal selection program customized for your application, and gives you a utility to quickly test your finished screens. It even includes a multi-key data file maintenance program which interacts with the screen you design. All the tools you need to generate code for the trickier aspects of your application, or even to create stand alone data entry and retrieval products without any programming.

Panel routines are powerful. Unlike so many programs which make error correction difficult once a field is departed, Panel gives the user full field-

to-field movement for editing, and overtype or insert/delete within fields.

A truly superior productivity tool every developer should have.

Product Code: S0400

Suggested Price: ~~\$295.00~~

Our Price:

\$235.00

FLOAT-87

Software Support for the 8087 Math Chip

Float-87™ is a library of floating-point math routines which are merged into a Lattice C interface library. The routines handle all arithmetic functions and the most frequently used transcendental or trigonometric functions, and pass all numbers to the 8087 to take advantage of its 80-bit data format.

Putting Float-87 to work with an 8087 can increase the speed of floating-point calculations by 40 times or more — and with greatly expanded accuracy. If you or your customers have an Intel 8087 math processor chip on board, this software will switch on its afterburners.

Product Code: S0700

Suggested Retail: ~~\$125.00~~

Our Price:

\$100.00

Your Art of the Possible

permitting up to 4,095 overlays stacked 32 deep. And you don't have to re-compile to re-arrange the structure.

Plink86 is a two pass linkage editor. On the first reading it determines all modules which need loading, to insure greater flexibility in assigning memory segment addresses before the disk file is created on the second pass. It can even sub-divide its linked output into multiple files for programs which must span more than one disk.

But most of all it sets you free to write the comprehensive code today's users have come to expect without sacrifices to memory constraints.

Product Code: S0500

Suggested Price: ~~\$395.00~~

Our Price:

\$315.00

You won't find an offer like this elsewhere: Exceptional prices and software fully supported by a knowledgeable staff specializing in 'C' and companion tools.

1-800-PC BRAND

That's 1-(800) 722-7263. In NY State call (212) 410-4001.

Charge your purchase to MasterCard or Visa.

Or mail your order and check to

PC Brand, P.O. Box 474, New York, N.Y. 10028

FROM THIS DAY FORWARD, ALL PC OWNERS WILL USE C. ITOH PRINTERS... OR BE DOOMED TO FAILURE.

You can buy a printer that spends half its life being fixed. Or, you can buy a C. Itoh.

C. Itoh printers are known the world over for doing their job over and over.

Fact is, most of our PC-compatible ProWriter™ and StarWriter™ printers in steady use for more than three years have never even seen the inside of a repair shop.

It's because we've put them through thousands of hours of testing under the most extreme conditions. Scorching temperatures. Sweltering humidity. Nothing slows them down.

Our ProWriter dot matrix printers zip along at up to 180 characters per second, which equals an incredible 100 lines per minute.

Our StarWriter daisy wheels give you letter quality at speeds ranging from 20 to 55 characters a second.

Our warranty is one of the best in the business—a full 12 months, backed by over 400 Service Centers coast to coast.

Because of C. Itoh reliability, we sell two million printers a year to people who can't stand failure.

Your printer dealer will be happy to make it two million and one.

For more information, just write C. Itoh Digital Products, Inc., 19750 South Vermont Avenue, Suite 220, Torrance, CA 90502.

Or phone toll free 1-800-423-0300. In Massachusetts, call 1-617-769-8770.



© 1984 News Group Chicago, Inc.

hart

C. Itoh
DIGITAL PRODUCTS



™ ProWriter and StarWriter are Trademarks of C. Itoh Digital Products, Inc.
© 1984 C. Itoh Digital Products, Inc.

CIRCLE 166 ON READER SERVICE CARD

MAI/BASIC FOUR

ity allows you to select invoices by pay cycle, due date, or discount due date. There is also a manual payment feature that allows you to select individual invoices. If the printer jams while you're printing checks, you can start over for a selected group of checks, or print all the checks by invoking the restart function.

The reports you'll use on a day-to-day basis include listings (registers) of invoices entered, manual checks entered, and checks produced by the system: an open-invoice report; a cash requirements report (to help you plan your disbursements); and, of course, your checks. You must use one of only two predefined check formats. A listing of all vendors is available, as are mailing labels and a cross-reference listing, which is a listing of all vendor names and numeric codes sorted side-by-side in both numeric and alphabetical order.

Period-end processing automatically generates two audit trail reports—an aged open-invoice report and a period-to-date disbursement register. Additionally, at period end, a check reconciliation function is available. You can enter information

At period end, the system can print out a neatly formatted report showing the reconciliation of checks to the book cash balance.

such as bank statement balances, deposits in transit, outstanding checks, and adjustments; the system will print out a neatly formatted report showing the reconciliation to the book cash balance.

Accounts Receivable

MAI's *Accounts Receivable* package closely mirrors the *Accounts Payable* system in its Definition, Operation, and Maintenance functions. The system can operate as a standalone subledger or can interface with the *General Ledger* pack-

age. According to MAI, the *Order Entry* and *Sales Analysis* packages (released too late for this review) also interface with *Accounts Receivable*.

In defining your system, you must choose either the balance-forward or open-item method of accounting for your receivables. With the balance-forward method, invoice detail will be retained only until period-end processing, at which point the detail is summarized. Payments are always applied to the oldest open invoice. With the open-item method, invoices are retained in your data files until they are paid. You apply payments to specific open invoices when entering cash receipts.

MAI's *Accounts Receivable* system contains one feature that is unique and a real benefit to those of you who use the cash method of accounting but need to keep track of customer receivables. You can set up the system to report income to the general ledger only when cash receipts are recorded (not when invoices are recorded). However, you will be able to apply full payments only to invoices recorded within the customer ledger, not

WORLDWIDE ENTERPRISES CUSTOMER MASTERFILE MAINTENANCE

DATE: 07/05/84

CUSTOMER CODE: 0060

LAST VIEWED: NONE

NAME: Open Road Constr. Co.

ADDRESS: 5075 Plains Blvd.

Laramie, WY 82070

SORT KEY: Open Roa

LOCATION: 82070

PHONE: 307-545-8231

CUSTOMER STATUS:

CREDIT CODE: cc

LIMIT: 2500.00

DATE ACCT OPENED: 05/01/83

DATE LAST ORDER: 06/09/83

DATE LAST PAYMENT: 06/06/83

TYPE CUST: cc

STATEMENTS? (Y-N): Y

LATE CHARGE? (Y-N): Y

TAX CODE:

IS THE DATA CORRECT? (Y-N) Y

Figure 2: MAI's *Accounts Receivable* system maintains this basic information for each customer. You can also bring up a customer aging summary and open-invoice display from this screen.

DATE: 07/16/84		WORLDWIDE ENTERPRISES CUSTOMER CROSS-REFERENCE		PAGE: 1
CUSTOMER CODE SEQUENCE		ALPHABETICAL SEQUENCE		
0001	Forest Lumber Co.	Central School Systems	0050	
0010	Government Purch. Agent	Forest Lumber Co.	0001	
0020	Sunshine Soccer League	Government Purch. Agent	0010	
0030	Waterways Freight Inc.	Open Road Constr. Co.	0050	
0040	Railways Limited	Railways Limited	0040	
0050	Central School Systems	Sunshine Soccer League	0020	
0060	Open Road Constr. Co.	Waterways Freight Inc.	0030	

Figure 3: Cross-referenced by customer code and alphabetical sequence, this listing for the customer master file in MAI's Accounts Receivable package lets you quickly key in on a given customer name or number.

to partial payments or prepayments.

The system can be directed to perform finance charge computations based on a fixed rate, a variable rate, or a specific amount for each customer. You can choose the option of booking these finance charges to the general ledger or merely having them show up as a memo on customer statements. Furthermore, when calculating finance charges, you can choose whether or not to include previously outstanding finance charges in the calculation.

The sales tax code maintenance function permits you to establish and maintain a two-character alphanumeric code for each distinct sales tax computation percentage. A facility for dealing with whether or not freight charges are taxable is also included, since the related laws vary from state to state.

Figure 2 illustrates the type of information maintained for each customer. A three- to seven-character alphanumeric code is used to identify each customer, and the first two characters of the customer code can be used to designate divisions, so you can segregate the reporting of your receivables by division. This can be quite handy for a company that keeps separate receivables records for many divisions or locations.

A sort key is available and defaults to the first eight characters of the customer's name. Three optional fields are available

to further identify customers: customer type (two characters), credit code (two characters), and location (five characters). Unfortunately, none of the report programs permits you to create a report sorted

The system can be
directed to
perform finance
charge computations
based on a fixed
rate, a variable
rate, or a specific
amount.

by any of these three identifiers. The customer master-file maintenance function allows you to produce a customer cross-reference listing such as the one shown in Figure 3. You can also print customer mailing labels in a single-vertical-column (one-up) format in customer-code order or in alphabetical order.

Invoice processing is accomplished in one of two ways. The invoice data entry facility is used when you are setting up the MAI Accounts Receivable system and you do not need to print an invoice for an entry. The detail invoice data entry function is used during day-to-day processing

and printing of invoices. Invoice dollar amounts must be distributed to the general ledger during this process. Invoices are held on file and can be edited freely before they are posted during the updating process. A register of all open invoices can be printed to allow you to check your entries for accuracy.

The invoice processing function automatically extends the quantity and price information and also computes applicable sales taxes; discount information can also be entered at this point. Invoices can be printed in only one predefined format. After entering and printing your invoices, a detailed sales journal can be printed.

Cash receipts processing is a straightforward operation that affords you significant flexibility in the cash "application" process. If you are maintaining your records using the balance-forward method, you simply apply the cash to the customer's account. If, on the other hand, you're maintaining open-item records, you can apply the cash either to a single invoice or to multiple invoices on an oldest-invoice-first basis. Additionally, you can assign the cash directly to a general ledger account. This last option is appropriate for those cases when you need to record cash that is not in payment of an outstanding receivable (such as the return of an employee advance). The system also allows prepayments to be processed. A cash receipts journal is available for audit

1.2.3

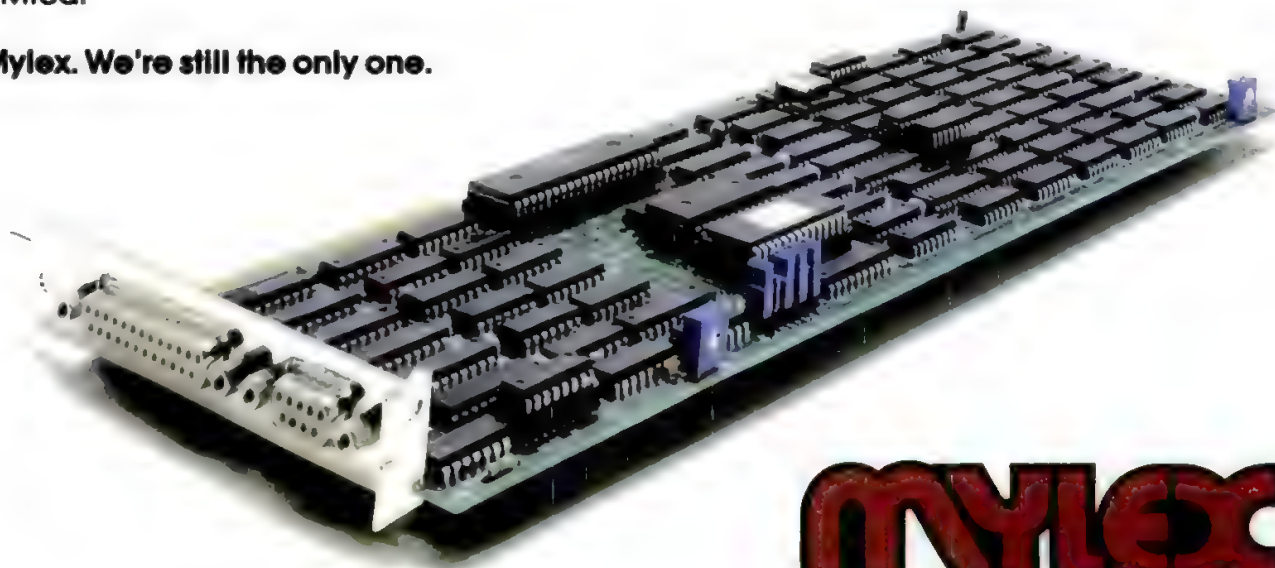
MYLEX – THE ONLY TOTALLY IBM PC/XT COMPATIBLE GRAPHICS BOARD THAT RUNS LOTUS 1-2-3™ ON THE IBM® MONOCHROME MONITOR IN SHADES OF GREEN.

Lotus 1-2-3 runs with 9 x 14 alphanumerics and bit mapped graphics on your IBM monochrome display with the Mylex "Chairman" graphics board. So do Flight Simulator™ and Night Mission Pinball™. So do **all** other IBM software compatible programs. That's because the "Chairman" emulates the IBM monochrome and color/graphics adapter boards. Games, graphs and professional graphics are displayed in shades of green on monochrome displays.

Or the Chairman will drive your IBM color monitor in up to 16 colors. And the Mylex custom character RAM provides you with the equivalent of an APL ROM. Of course the Chairman includes a parallel printer port.

The Mylex software diskette (\$150 value) gives you APL characters, your own characters and other enhanced features of the "Chairman": 320 x 200 – 16 colors, 640 x 200 – 4 colors, 640 x 400 – green and black. Retail price is \$595 including diskette. Dealer inquiries invited.

Mylex. We're still the only one.



MYLEX™
Mylex Corporation

5217 N.W. 79th Avenue • Miami, Florida 33166 • (305) 592-9669 • 800-446-9539 • 800-336-9539 (FLORIDA)

• Lotus 1-2-3 is a registered trademark of Lotus Development Corp. • Flight Simulator is a registered trademark of the Microsoft Corp. • Night Mission Pinball is a registered trademark of the Sublogic Corp. • IBM is a registered trademark of the IBM Corp.

CIRCLE 372 ON READER SERVICE CARD

trail purposes.

The system lets you write off uncollectible accounts and produces on-demand customer statements at any time. Period-end processing computes and posts finance charges, produces period-end reports (including a summary of sales taxes and an aged open-receivables listing), and prints customer statements. Other period-end reports include a sales tax report and an aged open-invoice report.

Inventory

Like many similar product offerings, MAI's *Inventory* system is focused upon the record-keeping needs of a wholesale distribution business. However, it could be used in many other situations as well—keeping track of a manufacturer's raw materials or finished goods inventory, for instance.

In defining your system, you must specify the costing method: LIFO, FIFO, or moving average cost.

In setting up your inventory system, you are faced with several decisions, the first of which relates to the length and format of your inventory item numbers. MAI affords you a great deal of flexibility in this regard. The item code can have from one to three distinct segments, and each segment can be of any length as long as the entire code does not exceed 20 characters. This is by far the longest item code we've yet encountered in a PC-based inventory system.

You specify each segment's length, description, type (alphanumeric or numeric), and whether or not your inventory reports should include subtotals for all but the last segment. If you segment your inventory items properly, you can better

analyze your inventory reports by class (or type) of product.

In defining your system, you must specify the costing method: LIFO (last in/first out), FIFO (first in/first out), or moving average cost. If you choose LIFO or FIFO, the system will maintain up to eight levels of costs for each item. If you choose the average cost method, you are asked whether or not the system should allow item quantities to fall below zero—a real-world circumstance in businesses with rapid movement of inventory.

The system definition routines include a unique feature that lets you specify the precision (number of decimal places) for tracking units and costs. You can specify zero to four decimal places for units and two to four units for costs. This would be helpful if you price some of your inventory items at, say, .7525 cents.

MAI's *Inventory* package takes a unique approach to interfacing inventory transactions to the *General Ledger*. To automatically supply accounting information to MAI's *General Ledger*, you must establish and maintain one or more distribution codes. For each distribution code, you establish a table as follows:

General Ledger Account	
Debit	Credit
Receipt: 1015-001	2001-001
Issue: 5050-001	1015-001
Adjustment: 1015-002	5120-002
Physical count: 1015-003	5120-002
Sale:	4050-001

The link to the *General Ledger* program is established when, as you set up your inventory items, you assign one of the distribution codes to each item. Then, as the transactions are processed, the system will know which financial accounts will be affected.

This scheme offers a lot of flexibility in reporting the financial impact of your inventory transactions. This could be an important asset if you want to segregate financial reporting of various products or product lines.

The system provides several useful

functions to address your physical inventory requirements. You can print out inventory count sheets that list, for each item, an item number and description, a location, and a unit of measure. You can use the count sheets to record the physical inventory counts and then enter these quantities with a special physical count

You can restrict access to many of the system functions.

data entry function. This information is used to produce the physical count summary report, which lists, for each item, the on-hand (book) count and value, the physical count and value, and the variance between the two. After the *Inventory* system produces this report, it asks if you want to update automatically the inventory records to reflect the adjustments from book to physical. An affirmative response will direct the system to update your inventory records and produce the necessary general ledger transactions.

One unfortunate drawback to this set of routines is the fact that if you do *not* enter a physical count for an item, the system assumes the count to be zero! This precludes you from using the system to do anything but a complete physical inventory. With a few enhancements, the routines could be used for cycle (partial) counts as well.

Seven basic inventory reports are available. These include a master-file listing, a valued inventory report, a reorder report (listing those items for which the on-hand quantity is less than the reorder quantity you've established), a discontinued items list, and a price list. At period end, you can get a movement report, which summarizes receipts, issues, and adjustments for each item. You can also generate a transaction audit list.

MAI's *Inventory* system does lack fea-

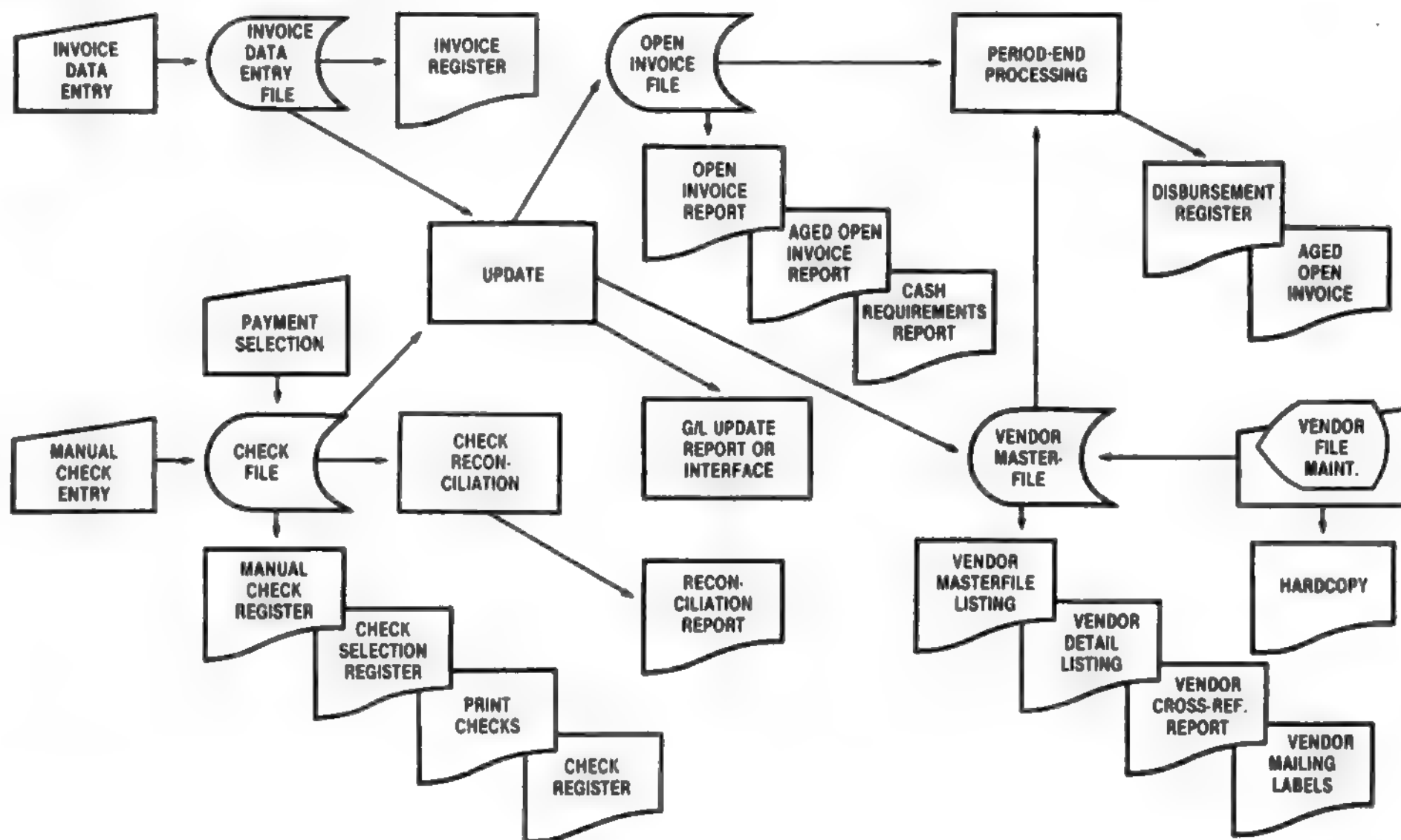


Figure 4: A system flowchart is provided with each MAI package. This one gives an overview of the Accounts Payable system.

tures found in a number of similar systems for the PC. For example, you cannot establish custom or user-defined data fields in your master file; inventory counts are kept for only a single location; you cannot establish a picking list sequence to make your picking/packing operations more efficient; there are no special reports of slow-moving items; and the system has only a single price level within the inventory file. Nonetheless, the features that MAI's package does have can provide an inventory accounting solution for a great number of businesses.

Functions at Your Fingertips

A noteworthy feature in the MAI accounting series is the effective use made of the PC's function keys. When you buy the software, you are supplied with a solid plastic template that fits neatly around the function keys (much like the one supplied with Lotus's 1-2-3). The function keys make it easier to review accounting

records and respond to certain prompts. The key assignments are as follows:

Next	Prior
First	Last
Date	List
Delete	End
Yes	No

MAI's spiral-bound manual gives clear and concise instructions for software installation—a pretty straightforward process. Handy flowcharts (see Figure 4) give you a quick overview for each package. The manual makes good use of typefaces, which vary in size and boldness. Two colors are used, and the text is well illustrated. Each manual has a glossary of accounting terms as well as a seven-page primer on double-entry bookkeeping. The documentation includes an easel and diskette labels for your convenience.

Storage and Security

The file sizing/resizing facility, found in the Definition section of each system, is an unusual feature that lets you define the sizes of various system files. Figure 5 shows the screen used to size your *Accounts Payable* files. You would begin by entering the number of vendors with whom you expect to be doing business, or accept *Accounts Payable*'s default value of 10. After you complete all 11 specifications, the information is translated into file sizes appropriate for your installation. Figure 6 shows the file sizes that were computed based on the information shown in Figure 5. Most importantly, the screen indicates the total disk storage required for your files. You can then use this information to manage your disk storage requirements.

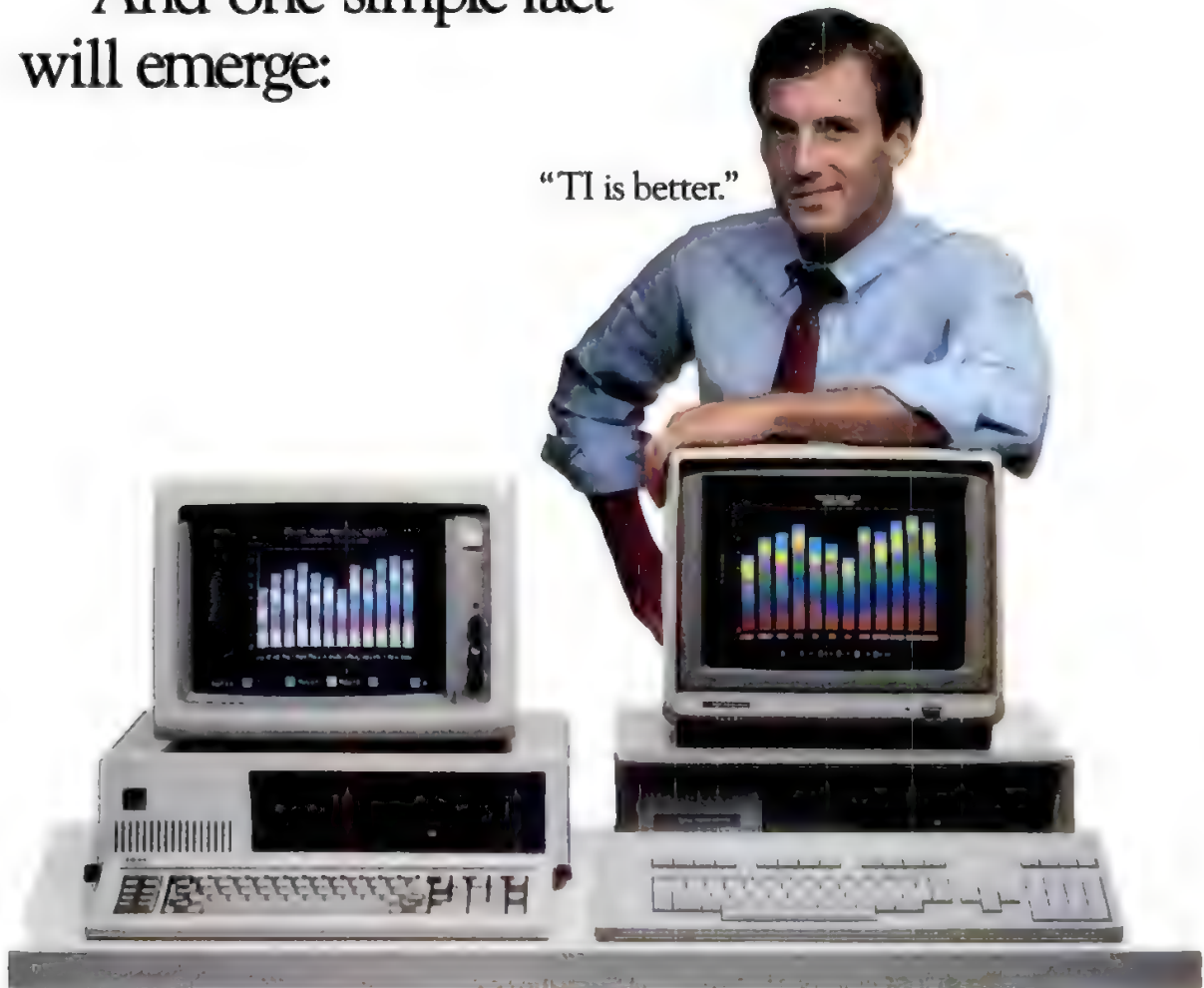
The Definition section of each system also contains a password maintenance function that lets you restrict access to many of the system functions by setting up

Dare to Compare. Come in. Sit down.
Run both PCs. IBM vs. TI. Side by side.
Compare how they run powerful software.
Like 1-2-3™ from Lotus. Or BPS Business
Graphics™. Or MultiMate™.

Compare speed. Keyboards. Graphics.
Service and support. Compare everything
a PC can do for you.

And one simple fact
will emerge:

"TI is better."



IBM Personal Computer
(1-2-3 from Lotus)

Texas Instruments Professional Computer
(1-2-3 from Lotus)

Take TI's "Dare to Compare" challenge today. Selected dealers want you to see for yourself how the TI Professional makes the best software perform even better. You'll also learn how TI backs you with outstanding service and support, including an optional 24-hour customer support line and extended 1- or 5-year warranties. Call us toll-free at 1-800-527-3500 for your nearest TI dealers.

IBM is a trademark of International Business Machines, Inc. Lotus and 1-2-3 are trademarks of Lotus Development Corporation. BPS Business Graphics is a trademark of Business & Professional Software, Incorporated. MultiMate is a trademark of SoftWord Systems. Copyright © 1984, Texas Instruments Incorporated.


**TEXAS
INSTRUMENTS**
Creating useful products and services for you.

MAI/BASIC FOUR

passwords for certain menu selections. To control this whole process, you must password-protect the Definition section to restrict access to the password maintenance menu.

Prior to sending its software out into the micro world, MAI developed an advanced version of its Business BASIC interpreter known as Business BASIC/Micro or BB/M. Although we did not have the chance

to review it, the language is worth mentioning because all of MAI's microcomputer accounting packages are written in BB/M.

BB/M is designed to speed program

WORLDWIDE ENTERPRISES FILE SIZING/RESIZING

FILE SIZE SPECIFICATIONS:

1.	NUMBER OF VENDORS:	10
2.	ONE TIME ONLY VENDORS:	7
3.	INVOICES ENTERED AT ONE TIME:	10
4.	INVOICES OPEN AT ONE TIME:	50
5.	AVERAGE G/L DISTRIBUTIONS PER INV:	1.5
6.	CHECKS PRINTED AT ONE TIME:	10
7.	AVERAGE INVOICES PER CHECK:	2.5
8.	CHECKS WRITTEN PER PERIOD:	25
9.	MANUAL CHECKS WRITTEN AT ONE TIME:	5
10.	NUMBER OF CHECKING ACCOUNTS:	5
11.	NUMBER OF TERMS:	10

IS THE DATA CORRECT? (CR-N-END-LIST)

Figure 5: The file-size specification screen for the Accounts Payable module. The program will automatically size the files for your system and compute file requirements as shown below.

ACCOUNTS PAYABLE FILE REQUIREMENTS

FILE DESCRIPTION	FILE TYPE	FILE NAME	KEY SIZ	NO. RECS	BYTES /REC	TOTAL SECS	RECS SIZED	RECS USED
VENDOR MASTERFILE (1)	DIR	VMF01	12	10	230	8	10	10*
VENDOR MASTERFILE SORT (1)	SRT	VMF02	19	10	0	3	10	9*
NOT ON FILE VENDORS (2)	DIR	VMF05	15	7	116	5	5	0
CHECKWRITING (6)	DIR	APC01	19	11	84	5	11	1
CHECKWRITING DETAIL (6,7)	DIR	APC02	19	25	92	9	25	0
DISBURSEMENTS HEADER (8)	DIR	APC03	11	25	92	8	25	10
DISBURSEMENTS DETAIL (7,8)	DIR	APC04	21	62	64	14	62	15
OPEN INVOICE MASTER (4)	DIR	API01	19	50	108	16	50	17
INVOICE DATA ENTRY (3,5)	DIR	API02	21	26	108	10	26	1
OPEN INVOICE DISTRIBUTION (4,5)	DIR	API03	21	1	48	4	1	0
MANUAL CHECK DATA ENTRY (9,7,5)	DIR	APM01	23	22	96	9	22	1
TERMS CODE MASTERFILE (11)	DIR	APT01	5	10	64	5	10	3
BANK ACCOUNT ID MASTERFILE (10)	DIR	APF00	4	5	64	4	5	2
CHECK RECONCILIATION (8)	DIR	CKR01	11	35	72	5	35	8
TOTAL BYTES REQUIRED FOR FILES:						55808		

DO YOU WANT TO SIZE/RESIZE FILES? (Y-N)

Figure 6: The Accounts Payable file requirements computed from the information shown in Figure 5. The numbers in parentheses next to the file descriptions refer to the specification numbers (see Figure 5) that are used to arrive at the file-size computation.

development, and MAI claims that it is one of the easiest, fastest, and most complete business-oriented development environments available on a microcomputer. The language is specifically designed for the transaction-based procedures that dominate accounting applications.

As part of its marketing strategy, MAI is making BB/M available to software developers. The company's aim is to make it easy for the developer or sophisticated user to customize vertical applications to integrate with MAI's accounting

Buying the fanciest system makes no sense if all the extra features just get in the way.

software or modify the source code of MAI's software for special customer needs.

Also, because BB/M uses MS-DOS-compatible file structures, programs can be written to access data created by other MS-DOS applications.

Conclusion

MAI's accounting software benefits from its minicomputer heritage. While the packages lack some of the wide-ranging features of competitive products, they are straightforward, easy to set up, and easy on the user. "Extras" are not helpful to you if your business won't use them. On the contrary, they may be more trouble than they're worth. Selecting the right system for your business is simply a matter of determining which software package meets the majority of your accounting and management reporting needs, present and near term. Buying the fanciest system makes no sense if all the extra features just get in the way. Examine your needs and MAI's features carefully. It could be a perfect match.—G. William Dauphinais and Michael A. Yesko

NEW HIGH HARD DISK CAPIN FOR INCREASED SPEED PERFORMANCE

\$895.00

IS00 • 10 Mega-byte Winchester With Hard Disk Controller

UPGRADES FOR YOUR IBM® PC /PC COMPATIBLES

IS01 • 10 Mega-byte Winchester • Floppy/Hard disk controller	IS41 • Half-high tape drive • Half-high floppy drive • 40 Mega-byte Winchester • Hard disk controller • XT-Power Supply
\$1095.00	\$1395.00
IS02 • 10 Mega-byte Winchester • Floppy/Hard disk controller	IS42 • XT-Power Supply
\$1295.00	\$ 395.00
IS16 • Half-high tape drive • XT-Power Supply	
\$ 995.00	
IS17 • Half-high tape drive • Half-high floppy drive • XT-Power Supply	
\$1245.00	
IS18 • Half-high tape drive • Half-high 10 Mega-byte Winchester • Hard disk controller • XT-Power Supply	
\$2095.00	
IS20 • 20 Mega-byte Winchester • Hard disk controller	
\$1545.00	
IS21 • Half-high tape drive • Half-high 20 Mega-byte Winchester • Hard disk controller • XT-Power Supply	
\$2495.00	
IS40 • 40 Mega-byte Winchester • Hard disk controller • XT-Power Supply	
\$2895.00	

TIPS FOR YOUR IBM XT

XT01 • Half-high tape drive
• Half-high floppy drive

\$ 995.00

Micro Design International Inc. has been serving the computer industry for over 7 years, call us today for our complete line of products.

TO ORDER CALL COLLECT
800 877-8371

11000 Corporate Center • Irvine, CA 92714

MICRO DESIGN INTERNATIONAL INC.

11000 Corporate Center
Irvine, CA 92714

CIRCLE 169 ON READER SERVICE CARD

DP SHOPS: Still Using Wordstar?

EDIT COBOL and data files with Edit Tool, the program editor with mainframe power. Programmers need the right tools to get their work done fast. Why use anything less?

Only Edit Tool can:

- Browse/Edit over 10 files at once, with 10 buffers for data transfer.
- Handle large files - up to 1 MB - with direct record access.
- Edit EBCDIC files. Edit data files in FIXED LENGTH. Edit in HEX.
- Offer data security, with automatic backup and power down recovery.
- Restore 64 edit changes. Redefine function keys. Display line numbers.

Demand the best. Get mainframe editing power for your PC.

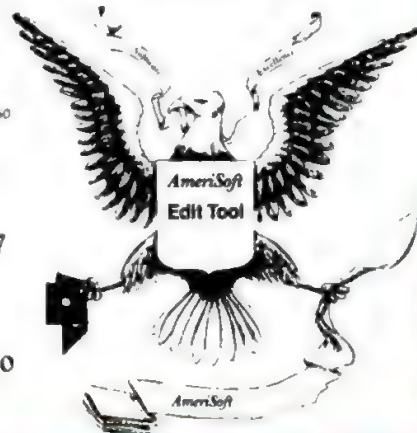
EDIT TOOL

List \$225. Demo Disk \$10
In CA: List \$238⁵⁰. Demo Disk \$10⁶⁰
Add \$3 for shipping
CALL TOLL FREE
1-800-358-9092 x627
In CA: 1-800-862-4982 x627

AmeriSoft™

(707) 778-8594
345 So. McDowell Blvd., Ste. 410
Petaluma, CA 94952

Wordstar is a trademark of MicroPro



CIRCLE 110 ON READER SERVICE CARD

We Interrupt this Program to bring you a Special Calculator

INSTANTLY FREEZES PROGRAM TO DO CALCULATIONS

TAPE DISPLAY FOR CHECKING FIGURES

TRANSFERS TOTAL INTO YOUR PROGRAM

WINDOWS OVER ANY PROGRAM ANYTIME

15 DIGITS MEANS CALCULATIONS TO 999 TRILLION

Tenkey is an instant business calculator program that you can use during any other application.

A simple keystroke instantly freezes your current program and opens a calculator window on the screen. Your 10-key pad now does the job of a desktop accounting calculator. Press another key and your program is running again. You can even post the Tenkey total back into your current program!

Tenkey has all the standard business calculator features: percent, constant

and memory keys. 15 digit entry. Even a tape display for double checking your figures.

Imagine... an integrated calculator that posts figures directly to payrolls, spread sheets, word processors and other programs. Just press a key and it's there. You'll save time in every step of your business computing. It's that powerful!

Now for the best part... Tenkey is only \$49.95! At computer stores everywhere. Stop in for a demo, then buy two. One for business & one for you.



For IBM-PC and compatibles

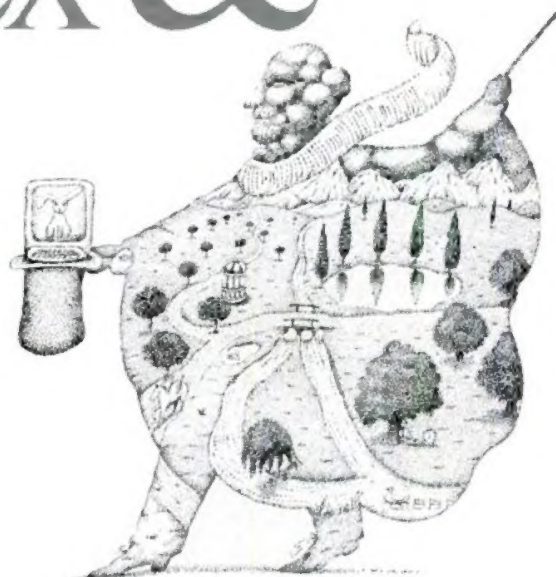
TEN KEY
THE ORIGINAL COMPUTER CALCULATOR

CIRCLE 245 ON READER SERVICE CARD



PHOTON SOFTWARE
P.O. BOX 1408
BELLEVUE, WA 98009
U.S.A.
(800) 426-2675
IN WASHINGTON (206) 451-8272

MagicIndex & WordStar: WORD MAGIC!



Now you can add fancy formatting, data merging, true proportional spacing, and automatic footnote, index, and table of contents features to make your WordStar documents shine as never before.

One of the most popular and widespread uses of PCs is for word processing. Since the appearance of the IBM Personal Computer, dozens of word processing programs have appeared to satisfy a wide range of text manipulation needs. Some are carryovers from earlier 8-bit CP/M machines, while others are new programs designed to take advantage of the hardware advances of the 16-bit environment.

The unquestioned champion of 8-bit word processors, however, is MicroPro's *WordStar*. Products like *MultiMate* and *WordPerfect* have eroded *WordStar*'s market share to some degree, but even

with all the competition, the MicroPro program has remained dominant.

Early PC versions of *WordStar* were direct conversions of the 8-bit program, which took little or no advantage of the PC's hardware. While the current releases of *WordStar* do use the extra memory, direct screen display, and function key features of the PC, the basic operation of the program is unchanged. As a veteran contender, *WordStar* offers users the benefits of consistency and familiarity, but many newer products simply offer more features. Some of the most obvious deficiencies in *WordStar* are its lack of automatic footnotes, automatic indexing, auto-

matic generation of tables of contents, and true proportional spacing.

Proportional Spacing

Almost all daisywheel and thimble letter-quality printers, and even some dot matrix printers, are capable of moving their printheads in very small horizontal steps, usually $\frac{1}{120}$ of an inch. Simple word processing programs don't use this ability at all; they justify right margins by adding entire space characters between words. This can be distracting and visually unappealing. Somewhat more sophisticated programs use the micro-spacing abilities that some printers have to add small

Introducing AST-PCnet II.



Now PC networking is as easy as plugging-in your phone.

The advantages of Local Area Networks (LANs) are well known. Existing personal computers can be tied together to share information and expensive peripherals such as disks and printers.

Now AST makes networking easier and more economical than ever before. With AST-

PCnet II, you simply insert the PCnet II board into an I/O slot in your IBM PC or XT. Then connect the PCnet II "twisted-pair" cable to the main network cable using a standard modular "telephone jack."

The same kind of jack that's used on your telephone. To move your PC from one point to another on the network, simply plug in at the desired location. It's that easy.

With AST-PCnet II, anywhere from 2 to 160 PCs can be interconnected. Standard PC-DOS commands are used to access remote drives and printers. And dedicated file and print servers are not required, because shared PCs also function as standard workstations.

We're AST, the world's leader in communications and enhancement products for the IBM PC. To find out how AST-PCnet II can expand your IBM PCs and

XTs into a reliable, versatile LAN, call or write AST Research, 2121 Alton Avenue, Irvine, California 92714.

(714) 863-1333. TWX: 753699ASTR UR
AST-PCnet II is a development of AST Research Inc. Software protocols are based on technology licensed from Orchid Technology Inc.

AST

RESEARCH INC.



AST-PCnet II Local Area Network

CIRCLE 104 ON READER SERVICE CARD

MAGICINDEX

spaces between words (or, occasionally, within words) to line up margins. This technique works with normal printwheels and fonts and looks quite a bit better than space insertion. *WordStar* falls into this latter camp of programs using the micro-spacing technique.

Normal printwheels attempt to keep all characters more or less the same width so that the typing and word processing output will look reasonably balanced. The special proportionally spaced wheels, however, make characters like *M* and *W* wider than the others to more closely imitate true typesetting fonts. If such wheels are used with standard word processing software, the wide characters will overlap in a word like "command." The software must make a special provision for such wheels—the printhead must be moved in exact increments based upon the actual width of the character to be printed. For example, the printhead would be moved much further for a capital *M* than for a lower-case *i*.

This type of printing is called *true* proportional printing to distinguish it from the micro-spacing technique, which is often erroneously called proportional spacing. True proportional output is far superior visually and can sometimes approach typeset copy for eye appeal.

Many of the serious word processing programs for the PC include true proportional spacing, but *WordStar* does not. There is an unsupported and unofficial way to patch *WordStar* to come close to true proportional printing, but the method is clumsy and doesn't work terribly well.



MagicIndex

Computer Editype Systems
509 Cathedral Parkway
New York, NY 10025
(212) 222-8148

List Price: \$295

Requires: 90K RAM, one disk drive, letter quality printer.

CIRCLE 800 ON READER SERVICE CARD

The lack of proportional printing and many other deficiencies of *WordStar* are addressed by a program called *MagicIndex*, from Computer Editype Systems of

New York City. *MagicIndex* includes true proportional printing and other fancy formatting routines, a replacement for Micro-Pro's *MailMerge* utility, and completely

IT'S A MODEM! IT'S A PHONE IT'S BOTH



**Special
Introductory Price**

\$649

Plus \$3.50
shipping and handling



Tel-A-Modem™
the 300/1200-baud intelligent
modem inside a high-quality,
two-line telephone. It lets you
mix voice and data easily, and
it all fits into one small
desktop footprint—with less
cable tangle.

Order through PC Brand

1-800-722-7263
(in New York State, (212) 410-4001)

That's a clever modem in there—autospeed, autodial, autoanswer, full duplex, asynchronous Bell 103/212A compatible. Works with all RS-232C-equipped systems.

It's so intelligent it's Hayes compatible. How compatible? It runs Smartcom II™, Hayes' own communications program, and all other packages designed for Hayes.

It's all the telephone you need, too—2 lines, selectable pulse/tone dialing, memory-dial with installed battery back-up and hold. Together, modem and phone give you instant switching between voice and data, and vice versa, without disconnecting and calling back, plus data monitoring—with its own volume control. Yet the Code-A-Phone® Tel-A-Modem sells for the price of a high-speed modem alone. It's like getting 2 full-function telephones free. And Tel-A-Modem is U.S.-made and carries a 2 year parts and labor limited warranty.



amaritec CORP.
345 East 86th St., NY, NY 10028

Tel-A-Modem & Code-A-Phone are trademarks of Code-A-Phone Corp.
Hayes Smartcom II is a trademark of Hayes Microcomputer Products, Inc.
Amaritec is a trademark of Amaritec Corp. PC Brand is a trademark of PC Brand.
Copyright © 1984 Amaritec Corp.

CIRCLE 142 ON READER SERVICE CARD

MAGICINDEX

automatic creation of indexes and tables of contents. It works with files produced by several word processors and text editors—there is a version specifically for *Word-*

Star—and it can team up with both Diablo and NEC printers. The syntax for the *WordStar* version is slightly different from the version for other editors; we'll use the

WordStar syntax here.

To use *MagicIndex*, text files are prepared with *WordStar* as usual except for the special *MagicIndex* commands embedded in the text. The *MagicIndex* commands are like *WordStar*'s dot commands, except that *two* periods precede the command rather than one. *WordStar* treats lines beginning with two periods as a comment and ignores them, so text entry and editing can proceed normally. The standard *WordStar* commands for bold-face, underscoring, and other "special effects" are recognized by *MagicIndex* and handled normally. *MagicIndex* adds a few wrinkles to the special effects options (see Figure 1), such as the concept of "transient" commands, which are cleared by the end of a paragraph. This eliminates the possibility of printing an entire document in boldface, for example, if the closing control character is omitted.

MagicIndex's dot commands are listed in Figure 2. Most of the commands work similarly to equivalent commands in

The centering and flush right commands produce very attractive headings.

WordStar, and the meaning of the others should be reasonably self-explanatory to experienced *WordStar* users. Two special commands, * and #, are used to define headers and footers. *WordStar* offers only single-line headers and footers, but multiple lines can be defined with *MagicIndex*. Using the centering and flush right commands can produce some very flexible and attractive headings.

MagicIndex also includes automatic footnoting capabilities. The text of a footnote is surrounded by Ctrl-E characters, and the program places the footnote at the bottom of the page, separated from the main text by a short line. If a footnote is

THE INNOVATIVE SERIES 8" Flexible Disk Subsystems

Turnkey external 8" flexible disk drive subsystem for the IBM PC and other small computers. Attractive, thinline enclosure, power supply, controller, cable & utility software including IBM 3740 Format. Single and dual drive systems available . . .



FROM
\$925

SPECIALIZING IN DISK AND MEMORY EXPANSION FOR YOUR PC

10 TO 70 MB
External Winchester Expansion
Plug-in-and-run External Winchester Subsystems for IBM PC. The following modules include enclosure, power supply, controller, cable, host adapter and utility software to provide the PC with the power of an IBM XT and beyond.

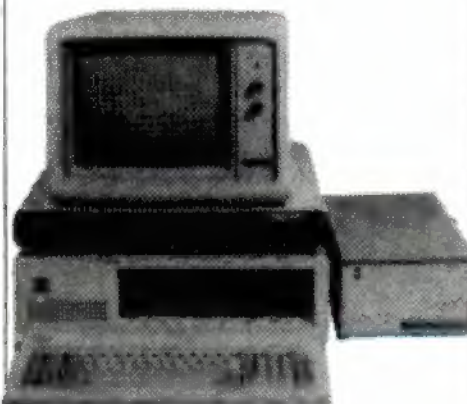


FROM
\$1295



TANDON
TM 100-2
\$175

5 1/4" FLOPPY DRIVES AND SUBSYSTEMS — Flexible disk drive expansion that upgrades floppy storage capacity with IBM equivalent drives or half height drives providing twice the capacity in the same space utilizing direct drive mechanisms and advanced technology for higher accuracy and reliability. Add-in drives and subsystems come complete with installation instructions



FROM
\$485

5 1/4" WINCHESTER DRIVES AND SUBSYSTEMS — Winchester expansion that upgrades your IBM PC to the level of a PC XT and beyond. Available as add-in or external (shown above) subsystems providing hardware and software compatibility with the IBM PC XT but with greater flexibility ready to plug in and operate in a variety of modular configurations to suit your present and future needs



FROM
\$150

64K RAM CHIPS

Set of 9 Chips 200 NS
Call for lowest advertised price.

SOFTWARE UTILITIES

TALL TREE
J. Format-2, Windrive, Jetdrive,
& J-Spool \$40 Each



FROM
\$525

**5 1/4" Half Height
Low Power
Winchester Disk
Drives**

INTEK offers the major lines of Tandon, CDC, Teac, WST (Siemens), Hi-Tech Peripherals, and Vertex disk drives.

TERMS: Add 2% shipping & handling on COD, VISA, MC. **FREE** shipping & handling on prepayment. Prices subject to change without notice. Combination and quantity discounts are applicable. No refunds. Approval required on credits. 20% restocking charge for returned items.

INTEK

2929 Newport Blvd. Ste 5
Newport Beach, CA 92661

(714) 675-2441

WARRANTY: 90 days to 1 year repair / replace depending on manufacturer.

SERVICE: All returns require an MRA (Material Return Authorization) number for in and out of warranty repair.

CIRCLE 152 ON READER SERVICE CARD